

### REMARKS

Claims 23-34, 38-50, 52-54 and 56-61 are pending.

New Claim 58 combines Claims 29, 47, 48, 49 and 56 and the Cu level of Claim 39. As explained at page 5 of the present application, there is a desire for a product simultaneously meeting thresholds for fatigue crack growth rate, tensile yield strength, and ultimate tensile strength. New Claim 58 reflects this.

Claim 59 is supported by Claim 56 modified according to Table 1 at page 9 of the specification to not include Cr except as incidental element or impurity.

Claim 60 is supported by Claim 45 to recite the presence of Sc. It is respectfully submitted Cassada does not disclose Sc.

Claim 61 has the Mg level of Claim 54 and the Cu level of Claim 40.

#### I. There is no overlap

As acknowledged in the Advisory Action, the amounts of copper and magnesium in the instant invention do not overlap the compositions of Cassada III as shown by the chart on page 8 of the Remarks filed 21 July 2008.

However, the Advisory Action asserts the difference between the amount of copper in the copper-containing aluminum base alloys of the instant invention and the amount of copper in the copper-containing aluminum base alloys disclosed in Cassada III ('516) would be 4.3 wt. % copper having a 1.5 wt. % Mg composition versus 4.22 wt. % Cu having a 1.5 wt. % Mg. Thus, the Advisory action asserts a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties.

#### A. It is submitted one skilled in the art would not have expected them to have the same properties

"Numerous court decisions recognize that an invention that otherwise might be viewed as an obvious modification of the prior art will not be deemed obvious in a patent law sense when one or more prior art references 'teach away' from the invention." Chisum on Patents, Sec. 5.03[3][a][i] LexisNexis (2003).

"A prima facie case of obviousness can be rebutted if the applicant ... can show that the art in any material respect 'taught away' from the claimed invention. A reference may be said to teach away when a person of ordinary skill, upon reading the reference, ... would be led in a direction divergent from the path that was taken by the applicant." *In re Haruna*, 249 F.3d 1327, 1335, 58 USPQ2d 1517, 1522 (Fed. Cir. 2001)(ATTACHMENT 1)(citations omitted); *See also, Gillette Co. v. S.C. Johnson & Sons, Inc.*, 919 F.2d 720, 724, 16 USPQ2d 1923, 1927 (Fed. Cir. 1990)(the closest prior art reference "would likely discourage the art worker from attempting the substitution suggested by [the inventor/patentee].")(ATTACHMENT 2).

*In Crown Operations International, Ltd. v. Solutia*, 289 F.3d 1367, 1372, 62 USPQ2d 1917 (Fed. Cir. 2002) in a patent to a safety and solar glass assembly in which a multi-layered film between glass layers included a metal-coated solar control film, the claims required, inter alia, that the solar control film contribute visible light reflection that is two percent (2%) or less of the reflection of the assembly; this solved a "wrinkle" problem. The prior art taught generally, that the solar film should contribute three percent (3%) or more. The Federal Circuit held the district court did not err in rejecting an obviousness challenge to the patent's validity. The Federal Circuit found that "although the prior art generally sought to reduce visible light reflectivity, it also taught the disadvantages of a very thin metal-coating in the substrate, including sacrificing infrared reflectivity." (ATTACHMENT 3).

See also, MPEP §2145.X.D.3, citing *In re Hedges*, 783 F.2d 1038, 1041, 228 USPQ 685 (Fed. Cir. 1986)(Applicant's claimed process for sulfonating diphenylsulfone at a temperature above 127°C was contrary to accepted wisdom because prior art as a whole suggested using lower temperatures for optimum results as evidenced by charring, decomposition, or reduced yields at higher temperatures.)(*In re Hedges*, ATTACHMENT 4).

Cassada III repeatedly states his solubility equations relating Mg and Cu levels are mandatory such that the solubility limit is not exceeded. Cassada III, col. 3, lines 58-col. 4, line 8, explains, "It has been discovered that combinations of both high strength and high toughness are obtained in the alloy of the present invention by controlling the range of composition of the solute elements of copper and magnesium such that the solid

solubility limit is not exceeded.... It is important to avoid any excess solute that would contribute to the second phase content and diminish its fracture toughness."

Thus, one skilled in the art reading Cassada III would not expect the properties to be the same. If the properties are expected the same in or out of the compositions defined as mandatory they would not be defined as mandatory.

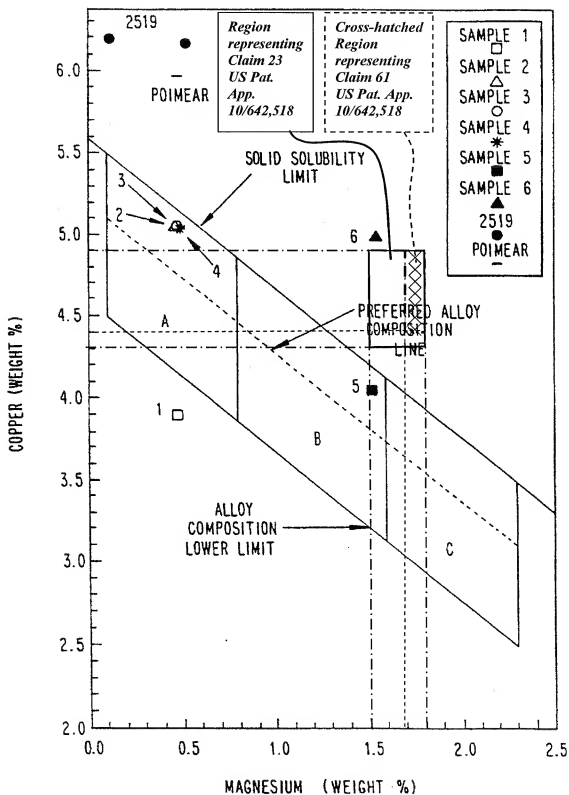
**B. Dependent Claims further distinguish over Cassada III**

The Advisory Action asserts the difference between the amount of copper in the copper-containing aluminum base alloys of the instant invention and the amount of copper in the copper-containing aluminum base alloys disclosed in Cassada III ('516) would be 4.3 wt. % copper having a 1.5 wt. % Mg composition versus 4.22 wt. % Cu having a 1.5 wt. % Mg. This applies to Claim 23. However, the following table shows dependent claims recite Cu and Mg levels which further avoid the composition region permitted by Cassada's  $Cu_{max}$  and  $Cu_{min}$  equations. This table corrects some inadvertent clerical errors in the Table in the Request For Reconsideration of 21 July 2008.

Present Claim	Mg range	Cu	Cu permitted by Cassada's $Cu_{max}$ and $Cu_{min}$ equations for this Mg range
Claim 23	1.5 - 1.8%	4.3 - 4.9%	2.95 - 4.22%
Claim 38	1.5 - 1.8%	4.3 - 4.6%	2.95 - 4.22%
Claim 39	1.5 - 1.8%	4.4 - 4.5%	2.95 - 4.22%
Claim 40	1.5 - 1.7%	4.4 - 4.9%	3.04 - 4.22%
Claim 41	1.5 - 1.7%	4.3 - 4.9%	3.04 - 4.22%
Claim 54	1.68-1.8%	4.3 - 4.9%	2.95 - 4.06%
Claims 56 and 57	1.6 - 1.7%	4.3 - 4.5%	3.04 - 4.13%
New Claim 58	1.6 - 1.7%	4.4 - 4.5%	3.04 - 4.13%
New Claim 61	1.68-1.8%	4.4 - 4.9%	2.95 - 4.06%

The difference in the lowest amount of copper of Claim 58 and the corresponding highest amount of copper permitted by Cassada III is 0.27%. The difference in the lowest amount of copper of Claim 61 and the corresponding highest amount of copper permitted by Cassada III is 0.34%. These are large differences.

To emphasize this the following plot adds the region defined by the Mg and Cu ranges of Claims 23 and 61 to Cassada Fig. 1 which graphically shows the region of Mg and Cu combinations defined by the Cassada equations. The regions of Claim 23 and 61 do not overlap the region permitted by Cassada.



II. Further Explanation Regarding Data Showing Benefits of Selection of Claim 56

The Advisory Action appears to agree Alloy 2 is closer to Claim 56 than the closest exemplified alloy of Cassada III ('516); and proof of unexpected advantages may be in the form of direct or indirect testing of the claimed invention and the prior art. Thus, patentability can be established by proof of improved results for the claimed invention in comparison with prior art even more closely related than the prior art relied upon by the Examiner.

However, the Advisory Action requests further explanation of how Applicant concludes Alloy 1 shows unexpected properties over Alloy 2 since:

- (1) Alloy 1 has lower UTS than Alloy 2;
- (2) Alloy 1 has a tensile yield strength (PS) substantially similar to the tensile yield strength (PS) of Alloy 2; and
- (3) Alloy 1 has a lower improvement in lifetime over AA2024 than Alloy 2.

It is respectfully submitted an unexpected improvement in only one property is enough to establish patentability. MPEP 716.02.II.

Moreover, Alloy 1 obtains an unexpected beneficial combination of properties. Alloys 1 and 2 are compared to AA2024 and AA2524. Alloys AA2024 and AA2524 are well known heat treatable alloys having useful strength and toughness properties in T3, T39, and T351 tempers as stated at page 1 of the present application. Alloy 1 achieves advantageous higher tensile yield strength (PS) than Alloy 2 as shown in Table 2 while also having toughness significantly higher than baseline as shown in Table 3.

In particular, Alloy 1 has almost a 5% improvement in PS over Alloy 2. Thus, Alloy 1 is closer than Alloy 2 to achieving PS of AA2024 and AA2524 while having better UTS and FTGR than AA2024 and AA2524. This results in a useful balance of properties which make Alloy 1 unexpectedly more favorable than Alloy 2 where the higher PS is desirable. As explained at page 5 of the present application, there is a desire for a product simultaneously meeting thresholds for fatigue crack growth rate, tensile yield strength, and ultimate tensile strength. New Claim 58 reflects this by reciting:

a fatigue crack growth rate of less than 0.01 mm/cycles at  $\Delta K=20$  MPa $\sqrt{m}$  when tested according to ASTM-E647 on 80 mm wide M(T) panels at  $R=0.1$  at constant load and at a frequency of 8 Hz;  
a tensile yield strength of not less than 310 MPa in the L-direction; and  
an ultimate tensile strength in the L-direction of not less than 430 MPa.

Page 11 of the present application explains the following:

“From the results of Table 3 it is clear that the lifetime is the better the lower the level of manganese is. By adding silicon the strength levels (as shown in Table 2) increase again while the improvement in lifetime is still considerably high. That means that the improvement in fatigue crack growth rate is significantly higher when manganese levels are low, more or less independent of the level of silicon. That means that those alloys, especially at lower  $\Delta K$ -values, have a significant longer lifetime and therefore are very useful for aeronautical applications.”

Applicant notes Alloy 1 has higher Mg and higher Si than Alloy 2 and page 7 of the present application says, “Magnesium also provides strength to the alloy product.” However, the difference in Mg is only 0.07% from a base of 1.61% and is too small to be the driving force to the higher tensile yield strength (PS) of Alloy 1 shown in Table 2 as stated in the Declaration of Dr. Alfred Heinz, Jan. 14, 2008, para. 21. In contrast, the 0.25% Si of Alloy 1 is more than double the 0.11% Si of Alloy 2. Thus, Alloy 1 has unexpectedly better tensile yield strength than Alloy 2 as shown in Table 2 due to the increased level of Si in Alloy 1 (Declaration of Dr. Alfred Heinz, Jan. 14, 2008, para. 21).

As explained above, Applicants assert this Declaration of Dr. Alfred Heinz is entitled to be given weight because an Examiner may not under 35 USC §103 substitute his own speculation for the factual knowledge of those skilled in the art.

Furthermore as seen in the above Table A, Claim 56 encompasses Alloy 1 within such a small range that it would be reasonably expected that the unexpected results occur over the entire range. Although objective evidence of non-obviousness must be

commensurate in scope with the claims which the evidence is offered to support, the probative value of a narrow range of data can be reasonably extended to prove the unobviousness of a broader claimed range when one could ascertain a trend in the exemplified data which would allow him to reasonably extend the probative values thereof. *In re Clemens*, 206 USPQ 289 (CCPA 1980).

Thus, this showing of unexpected advantages for Alloy 1 over Alloy 2 is sufficient to prove unexpected results over Cassada for Claim 56.

In Conclusion:

The present application is in condition for allowance. Applicants request favorable action in this matter. To facilitate the resolution of any issues or questions presented by this paper, the Examiner is welcome to contact the undersigned by phone to further the discussion.

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APV/bms

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ATTACHMENT 1

*In re Haruna*, 249 F.3d 1327, 1335, 58 USPQ2d 1517, 1522 (Fed. Cir. 2001)(citations omitted)



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In re Haruna

U.S. Court of Appeals Federal Circuit  
No. 00-1283

Decided April 18, 2001

## PATENTS

[1] Patentability/Validity - Obviousness - Relevant prior art - Particular inventions (§ 115.0903.03) Patentability/validity - Design patents (§ 115.17)

Invention of design application for pre-recorded optical disk with transparent outer ring is not rendered obvious by prior art utility patent claiming disk with finished or colored outer region, since prior art patent teaches away from claimed design, in that object of prior invention is to conceal any manufacturing defects in outer zone of disks, and widening transparent area of conventional disks, as in claimed design, would defeat that purpose, and since prior invention is directed to finished product rather than disk substrate, and its teaching that substrate is transparent in its initial state therefore does not render claimed design obvious; although color may play role in patentability of design, and transparency has been equated with color in some cases, transparent region of claimed design differs from outer zone of prior invention in more than "color alone."

Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of Tsutomu Haruna and Sado Kita for "ornamental design for a pre-recorded optical disk" (serial no. 29/058,031). Patent examiner

rejected application for obviousness in view of prior art utility patent number 4,747,093. Reversed.

Andrew J. Patch, of Young & Thompson, Arlington, Va., for appellants.

Joseph G. Piccolo, associate solicitor, John M. Whealan, solicitor, and Sydney O. Johnson, associate solicitor, Arlington, Va., for U.S. Patent and Trademark Office.

Before Schall, circuit judge, Friedman, senior circuit judge, and Gajarsa, circuit judge.

Schall, J.

Tsutomu Haruna and Sado Kita (collectively, "Haruna") appeal the decision of the United States Board of Patent Appeals and Interferences ("Board") that upheld the examiner's rejection of the sole claim in design patent application serial number 29/058,031

## BACKGROUND

The sole claim of the '031 application is directed to an "ornamental design for a pre-recorded optical disk." The design differs from conventional pre-recorded optical disks in that the metallized region of the disk stops well short of the outer rim, and the disk has a relatively wide transparent region adjacent the outer rim.

The pen and ink and photographic versions of Figure 1 of the application are set forth below:

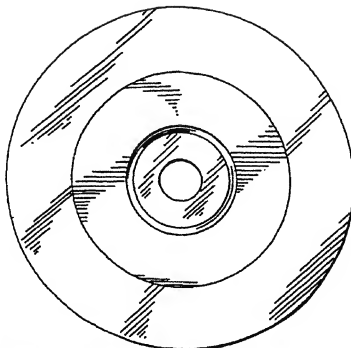


FIG. 1



FIG. 1

\*1519 As seen in the photographic figure, the outer ring of the disk is transparent, while the adjacent inner ring is metallized and may bear printing.

During prosecution, the examiner rejected the '031 application as being obvious under § 103 in view of Benne. Benne is a utility patent directed to disk-shaped information carriers, such as video laser

discs and digital audio discs. Benne, column 1, lines 9-11. Benne describes its disks as having at least three zones: (1) outer zone A; (2) center zone B; and (3) inner zone C. *Id.* at column 5, lines 8-12. Center zone B is metallized and contains the information recorded on the disk. *Id.* at column 5, lines 14-21. Outer zone A does not contain recorded information and may or may not be metallized.

*Id.* at column 3, lines 56-57; column 5, lines 49-50. According to the patent, this zone can be relatively large. *Id.* at column 2, line 26. Figure 1 of Benne illustrates the basic configuration of the Benne disks:

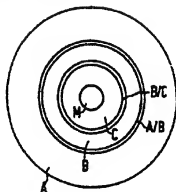


FIG.1

Zones A/B and B/C separate zones A, B, and C. *Id.* at column 5, lines 10-11. Reference letter M is not identified in the patent, but appears to identify the center hole of the disk. *See, e.g., id.* at column 5, line 13.

The object of the Benne invention is to manufacture disks in such a way as to conceal any cosmetic defects in outer zone A. *Id.* at \*1520 column 2, lines 23-27. The invention achieves this goal "by treating a surface of the outer zone . . . so that . . . the [disk] reflects any light falling in the outer zone at least partially diffusely and/or absorbs it at least partly, so that optical effects . . . which could adversely influence the appearance of the [disk] are at least partially masked or concealed." *Id.* at column 2, lines 39-49. The patent teaches that "[c]oncealment of the defects may be achieved by providing the outer zone . . . on its readout and/or back sides with a matt [sic] finish, printing, and/or one or more stick-on labels." *Id.* at column 3, lines 31-34. According to the patent, when outer zone A is not metallized, "the matt [sic] finish is then also visible from the

readout side and can . . . be used . . . as a background for printing applied to the outer zone on the readout side." *Id.* at column 3, lines 61-68. When the disk is fully metallized, "both the back and the readout side may be given a matt [sic] finish, be partially printed or provided with at least one stick-on label in the outer zone." *Id.* at column 4, lines 1-4. The patent also teaches the use of combinations of the disclosed concealing measures. *Id.* at column 4, lines 4-5. The teachings at column 8 of Benne provide further examples of decoration using "matt-printed [sic] parts, reflecting parts, and printed parts of any required color" in accordance with the invention. *Id.* at column 8, lines 54-68. Figure 2 of Benne illustrates "different possible combinations of the concealment measures." *Id.* at column 5, lines 41-42. In this figure, the outer zone is labeled as A1-A4, the inner zone is labeled as B1-B4, and the center zone is not labeled:

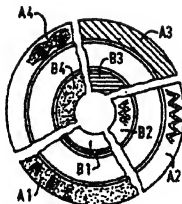


FIG. 2

In rejecting the '031 application over Benne, the examiner asserted that the characteristics of the claimed design were basically the same as those of the Benne disks. The examiner determined that the difference between the disk claimed in the application and the disks disclosed in Benne—the transparency of the wide outer region—did not lend patentability to the design. The examiner stated that the clarity and openness of the claimed design was obvious and expected from the conventional transparent material used as the substrate for the disk, and that the claimed design required no exercise of inventive faculty in either conception or execution. The examiner asserted that the teachings in Benne regarding an embodiment wherein outer zone A is not metallized, *id.* at column 3, lines 61-63, and an embodiment where color printing on one side of the outer zone can be seen from the other side, *id.* at column 5, lines 61-62, suggest a disk with a transparent outer region.

Haruna appealed the rejection of the '031 application to the Board. The Board sustained the obviousness rejection, citing the appearance of conventional disks and the teachings of Benne. The Board noted that conventional disks have “a relatively narrow, approximately three millimeter, extreme outer . . . region . . . [that is] unmetallized and transparent.” *Haruna*, slip op. at 3. The Board de-

termined that the only difference between the claimed design and the design of the disks disclosed in Benne is that the claimed design has a transparent outer region, whereas Benne teaches that the outer zone of its disks has “a matte finish or some other light-diffusing or light-absorbing imprint.” *Haruna*, slip op. at 5. The Board noted that Benne teaches that the printed material of its disks may be of “any required color,” *id.* (citing Benne, column 8, lines 54-68), and cited *In re Cohn*, 80 F.2d 65, 27 USPQ 412 (CCPA 1935), for the proposition that transparency is legally considered to be a color. *Haruna*, slip op. at 6.

The design at issue in *Cohn* was a cellulosic ribbon with a transparent center portion and edges that were a different color than the center portion. *Cohn*, 80 F.2d at 66, 27 USPQ at 412. The prior art was a design for a shoe strap consisting of “a strap with black marginal stripes and an intervening light stripe.” *Id.*, 27 USPQ at 413. The court determined that “[a]lternating stripes of color, arranged as they are [in the claimed design], are sufficiently \*1521 shown by the references.” *Id.* The court stated that “[t]he fact that the design here presented shows a transparent portion rather than a stripe of different color . . . creates no patentable novelty in the design.” *Id.* *Cohn* also sets forth the proposition that “[i]t cannot be successfully argued that patentabil-

ity of a design may rest on color alone." *Id.* at 65, 27 USPQ at 413.

The Board noted that *In re Iknayan*, 274 F.2d 943, 124 USPQ 507 (CCPA 1960), applied the principles set forth in *Cohn*. The design at issue in *Iknayan* was a tire with a sidewall having a portion that was white adjacent a portion that was chromatic. *Id.* at 943, 124 USPQ at 508. The prior art included tires having sidewalls with white portions adjacent colored portions. *Id.* at 943-44, 124 USPQ at 508. The court determined that "[t]he general appearance of appellants' tire is quite similar to that of [the prior art,]" and that "[s]election of a chromatic color to replace the dark color shown in the [prior art] would not produce any basic alteration or unexpected appearance." *Id.* at 944, 124 USPQ at 509.

The Board concluded from *Cohn* and *Iknayan* that the fact that the outer region of Haruna's disk is transparent where the outer region of Benne's disks are colored does not amount to a patentable difference. *Haruna*, slip op. at 6. Haruna appeals the Board decision. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(4)(A).

## DISCUSSION

Obviousness under § 103 is a question of law based on underlying findings of fact. *In re Gartside*, 203 F.3d 1305, 1316, 53 USPQ2d 1769, 1776 (Fed. Cir. 2000). We review the Board's factual findings for substantial evidence, and its legal conclusion of obviousness without deference. *Id.* at 1315, 53 USPQ2d at 1775-76.

Haruna argues that the decision of the Board should be reversed because Benne does not disclose or suggest a disk that looks like the claimed design. Haruna argues that the claimed design is antithetical to the teachings of Benne because Benne is directed to concealing defects in the outer region by covering up the outer region with a matte finish, printing, or labels, whereas the claimed design includes a transparent outer region in which any defects

would not be concealed. Haruna argues that the patentability of the claimed design lies in the combination of the shape of the claimed article and its surface ornamentation. Haruna acknowledges that the shape of the claimed disk is not new, but asserts that the design as a whole is patentable.

Haruna argues that the Board's reliance on *Cohn* is misplaced because that case relied at least in part on the color depletion theory of trademark jurisprudence, which was abrogated by the Supreme Court's decision in *Qualitex Co. v. Jacobson Products Co.*, 514 U.S. 159 (1995).<sup>FN1</sup> Haruna also attempts to distinguish *Cohn* by limiting it to its facts.

The Solicitor for the Patent Office argues that Haruna's design is obvious because Benne teaches that the substrate of its disks is initially transparent and because conventional disks have an outer rim that is transparent. The Solicitor argues that maintaining the transparency of the Benne disks or increasing the width of the transparent region of conventional disks would have been obvious to the skilled disk designer. The Solicitor argues that the Board's determination that Benne provides motivation to widen the narrow transparent region of conventional disks is supported by substantial evidence, citing the teaching in Benne that the substrates of its disks are transparent in their initial states. *See Benne*, column 1, lines 15-16.

The Solicitor argues that this case is factually similar to *Cohn* because the design at issue in that case was transparent where the prior art was colored. The Solicitor argues that *Cohn* remains good law because it does not specifically rely on the trademark color depletion theory. Moreover, the Solicitor argues, \*1522 the novelty and nonobviousness requirements of patent law are more stringent than the distinctiveness requirements of trademark law. The Solicitor argues that the facts of *Iknayan* also are similar to the present case because the design in that case was chromatic where the prior art was a dark color. The Solicitor argues that both *Cohn* and *Iknayan* support the Board decision on appeal because they both hold that changing the color of a

region of a design does not make the new design patentable.

The patentability of a claimed design turns on whether its overall appearance and visual effect are novel and non-obvious. *In re Rosen*, 673 F.2d 388, 390, 213 USPQ 347, 349 (CCPA 1982). Section 103 applies to design patents in much the same manner as it applies to utility patents. *Litton Sys., Inc. v. Whirlpool Corp.*, 728 F.2d 1423, 1441, 221 USPQ 97, 108 (Fed. Cir. 1984) (“35 U.S.C. § 103 (and all the case law interpreting that statute) applies with equal force to a determination of the obviousness of either a design or a utility patent.”); *Durling v. Spectrum Furniture Co.*, 101 F.3d 100, 103, 40 USPQ2d 1788, 1790 (Fed. Cir. 1996) (“In the design patent context, the ultimate inquiry under section 103 is whether the claimed design would have been obvious to a designer of ordinary skill who designs articles of the type involved.”). The obviousness of a design “is determined by ascertaining whether the applicable prior art contains any suggestion or motivation for making the modifications in the design of the prior art article in order to produce the claimed design.” *Hupp v. Siroflex of Am., Inc.*, 122 F.3d 1456, 1462, 43 USPQ2d 1887, 1891 (Fed. Cir. 1997). “A prima facie case of obviousness can be rebutted if the applicant . . . can show that the art in any material respect taught away’ from the claimed invention.” *In re Geisler*, 116 F.3d 1465, 1469, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997) (quoting *In re Malagri*, 499 F.2d 1297, 1303, 182 USPQ 549, 533 (CCPA 1974)). “A reference may be said to teach away when a person of ordinary skill, upon reading the reference, . . . would be led in a direction divergent from the path that was taken by the applicant.” *Tec Air, Inc. v. Denso Mfg. Mich. Inc.*, 192 F.3d 1353, 1360, 52 USPQ2d 1294, 1298 (Fed. Cir. 1999).

[1] The Board determined that the teachings of Benne combined with the general knowledge that conventional disks have a narrow transparent region at their rims renders the claimed design obvious. However, this determination ignores the teach-

ings in Benne that discourage a disk with the claimed design. As discussed above, the object of Benne is to conceal manufacturing defects in the outer zone of disks. Benne, column 2, lines 23-26. Benne achieves this object by treating the surface of the outer zone to provide a matte finish, or a colored surface, or a pattern, or a combination thereof. *Id.* at column 2, lines 40-49; column 8, lines 54-63. Broadening the transparent region of conventional disks would defeat the purpose of Benne, because providing a transparent region would not conceal any defects, and would result in a large region in which any defects would be readily apparent. Thus, Benne teaches away from the claimed design.

Benne’s teaching that the outer zone of its disks may not be metallized does not suggest the claimed invention. According to Benne, even if the outer zone is not metallized, it will be provided with some sort of finish that diffuses or absorbs light. *Id.* at column 2, lines 40-49. Moreover, the fact that Benne teaches that the substrate for its disks is transparent in its initial state does not render the claimed design obvious. The invention is not directed to a substrate for a disk, but to the final product, a pre-recorded optical disk. Because Benne teaches away from a final product having a broad transparent outer region, it does not render the claimed design obvious.

*Cohn* and *Iknayan* do not require the result reached by the Board. As a preliminary matter, we note that this court has determined that color may play a role in the patentability of a claimed design. *See, e.g., Avia Group Int’l, Inc. v. L.A. Gear Cal., Inc.*, 853 F.2d 1557, 1565, 7 USPQ2d 1548, 1554 (Fed. Cir. 1988) (citing, while discussing infringement, the district court’s discussion of the “separate coloration” of the pivot point of the claimed design for a shoe); *Litton*, 728 F.2d at 1443, 221 USPQ at 109 (upholding the validity of a design patent for a microwave oven where one feature of the claimed design cited by the district court was an oven door that had a “three stripe border with a central color

different from the inner and outer stripes"). More importantly, although the differences between the claimed and prior art designs in *Cohn* are similar to the difference between the claimed design and that of Benne, the prior art references considered in *Cohn* and *Iknayan* did not \*1523 teach away from the claimed design. The decisions in those cases therefore did not address a situation where the prior art taught away from replacing a colored region with a transparent region. Moreover, although the Court of Customs and Patent Appeals equated transparency with color in *Cohn*, the transparent region of the claimed design here differs more than by color from the outer zone of Benne. Specifically, the transparent region of the claimed design does not achieve the function of Benne of concealing defects in the disks. The difference between the design claimed in the '031 application and the design of the disks disclosed in Benne is one of more than "color alone" because of the unique difference in effect between a disk with a transparent outer region and a disk with an outer region of any other "color."

In both *Cohn* and *Iknayan*, the court determined that the designs on appeal did not have different overall appearances and visual effects than the designs of the prior art. *Cohn*, 80 F.2d at 67, 27 USPQ at 413 (determining that the difference between the transparent stripe of the claimed design and the light-colored stripe of the prior art was "indistinguishable in principle"); *Iknayan*, 274 F.2d at 944, 124 USPQ at 509 (stating that "[t]he general appearance of appellants' tire is quite similar to that of [the prior art]"). Here, however, the Board did not make such a finding. The Board's failure to apply the ultimate test for obviousness-whether the overall appearance and visual effect of the claimed design is obvious in view of the prior art-is fatal to its analysis. The Board therefore erred as a matter of law.

#### CONCLUSION

For the foregoing reasons, the decision of the Board

is

REVERSED.

#### COSTS

Each party shall bear its own costs.

FN1. The color depletion theory was based on the fact "that there are a limited number of colors in the palette, and that it is not wise policy to foster further limitation by permitting trademark registrants to deplete the reservoir." *In re Owens-Corning Fiberglass Corp.*, 774 F.2d 1116, 1120, 227 USPQ 417, 419 (Fed. Cir. 1985). In *Qualitex*, the Supreme Court noted that "[w]hen a color serves as a mark, normally alternative colors will likely be available for similar use by others," and stated that "if that is not so-if a color depletion'. . . problem does arise-the trademark doctrine of functionality' normally would seem available to prevent the anticompetitive consequences." *Qualitex*, 514 U.S. at 168-69. The doctrine of functionality "forbids the use of a product's feature as a trademark where doing so will put a competitor at a significant disadvantage because the feature is essential to the use or purpose of the article' or affects [its] cost or quality.'" *Id.* (alteration in original) (quoting *Inwood Labs., Inc. v. Ives Labs., Inc.*, 456 U.S. 844, 850 n.10 (1982)).

C.A.Fed.

In re Haruna

249 F.3d 1327, 58 U.S.P.Q.2d 1517

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ATTACHMENT 2

*Gillette Co. v. S.C. Johnson & Sons, Inc.*, 919 F.2d 720, 724, 16 USPQ2d 1923, 1927  
(Fed. Cir. 1990)

that the prior art compositions do not possess the same soot-reduction property and use. I would reverse the board's rejection of claims 2-14, 16-22, and 24-37, all of the claims before us on appeal.



The GILLETTE COMPANY,  
Plaintiff-Appellant,

v.

S.C. JOHNSON & SON, INC.,  
Defendant-Appellee.

No. 90-1320.

United States Court of Appeals,  
Federal Circuit.

Nov. 20, 1990.

Assignee of a patent for postfoaming shaving gel brought patent infringement action, and infringement defendant brought declaratory judgment action of invalidity and unenforceability against assignee. The actions were consolidated. The United States District Court for the District of Massachusetts, Collings, United States Magistrate, entered judgment for assignee, and defendant appealed. The Court of Appeals, Rich, Circuit Judge, held that the patent was not invalid for obviousness.

**Affirmed.**

**1. Patents  $\Leftrightarrow$ 112.3(1)**

Claims of patent holder were entitled to presumption of validity and challenger faced burden of showing, by clear and convincing evidence, their invalidity.

**2. Patents  $\Leftrightarrow$ 112.3(1)**

Challenger's burden of proving invalidity of claims of patent holder was not less-

ened by patent holder's introduction at trial of prior art not before Patent and Trademark Office during prosecution; fact that validity of those claims had previously been upheld in earlier litigation was also to be given weight, though not stare decisis effect.

**3. Patents  $\Leftrightarrow$ 21, 22**

Focusing on obviousness of substitutions and differences, instead of invention as whole, is legally improper way to simplify often difficult termination of obviousness. 35 U.S.C.A. § 103.

**4. Patents  $\Leftrightarrow$ 16.25**

Patent for postfoaming shaving gel was not invalid for obviousness; although individual components of substance were concededly well known at time of invention, prior art made no suggestion of gel, much less one in which water-soluble polymers were used. 35 U.S.C.A. § 103.

Robert E. Hillman, Fish & Richardson, Boston, Mass., argued for plaintiff-appellant. With him on the brief were Robert W. Furlong, Gregory A. Madera and Heidi E. Harvey.

Robert L. Baechtold, Fitzpatrick, Cella, Harper & Scinto, New York City, argued for defendant-appellee. With him on the brief were Henry J. Renk and Nicholas N. Kallas.

Before RICH, NEWMAN, and  
CLEVENGER, Circuit Judges.

RICH, Circuit Judge.

This appeal is from the July 31, 1989 judgment of the U.S. District Court for the District of Massachusetts (Collings, U.S.M.),<sup>1</sup> holding claims 1, 3, 8-10, 12-18 and 21-23 of Patent No. 3,541,581 to Monson on a shaving preparation not invalid under 35 USC 103 and infringed by the Gillette Company (Gillette). See *Gillette Co. v. S.C. Johnson & Son, Inc.*, 12 USPQ2d 1929, 1989 WL 87374 (D.Mass.1989), *reconsider-*

636(c). We refer herein to the opinions of the magistrate as those of the district court.

1. By consent of the parties, the case was referred to the United States Magistrate for trial and entry of judgment pursuant to 28 USC

ation denied, 15 USPQ2d 1795, 1990 WL 36143 (D.Mass.1990). Gillette appeals only on validity and does not contest infringement. We affirm.

### I. BACKGROUND

S.C. Johnson & Son (Johnson) is assignee of the Monson patent, which issued November 17, 1970 and is now expired. Although the patent title is "Package Containing A Post-Foaming Gel," the claims are drawn to a "stable, post-foaming gel" composition. The term "post-foaming" means that the claimed composition remains a gel as it is expelled from its container but foams up after it is spread over the user's skin. Johnson has marketed a commercial embodiment of the claimed composition under the well-known EDGE trademark since 1970.

Although claims 1, 3, 8-10, 12-18 and 21-23 are appealed, claim 1 is representative and will suffice for our purposes. Claim 1 reads:

1. A cleansing or cosmetic composition in the form of a stable, post-foaming gel consisting essentially of about 40-90% by weight water, about 4-25% by weight water-soluble soap, about 0.5-12% by weight volatile liquid post-foaming agent selected from the group consisting of saturated aliphatic hydrocarbons, halogenated hydrocarbons and mixtures thereof, and about 0.01-5% by weight of at least one water-soluble gelling agent which forms in said composition, a gel having a yield value sufficiently high to substantially restrain said composition from foaming for at least about 60 seconds, under static ambient conditions.

The controversy here revolves around the "water-soluble gelling agent" component of the claimed composition, which according to Monson's specification can be chosen from "water-soluble derivatives of naturally occurring substances such as cellulose, sucrose and glucose." As further disclosed by Monson, the gelling agent functions to modify the consistency of the composition by imparting "yield value," or flow resistance. The resulting solid state properties of the gel restrain its foaming

for a desired period of time, i.e., for about 60 seconds at 63° F. and one atmosphere. In preferred embodiments of the claimed composition wherein the gelling agent is a cellulose derivative, the water-soluble gelling agent also functions to enhance lubricity, allowing the shaving blade to glide across the user's skin with reduced friction.

During prosecution of the application for the Monson patent, the Patent and Trademark Office (PTO) examiner initially rejected the claims as obvious in view of Estignard-Bluard (Bluard) (U.S. Patent No. 2,995,521) and Friedenberg (U.S. Patent No. 3,240,396). Bluard discloses a "self-foaming" composition which can be formulated to have the consistency of a cream; gel-based compositions are not disclosed. Like Monson's, Bluard's composition can be thought of as "post-foaming" in that it spontaneously foams when spread over a user's skin. It includes soap, water, and foaming agent, as does Monson's. However, Bluard's composition does not contain a water-soluble gelling agent; he uses an oil-soluble "jellifying" agent, namely aluminum octoate. Bluard discloses that when saponaceous [i.e., soapy] compositions having the consistency of a cream are used (for example, shaving creams), it is preferable to "thicken the organic liquid [foaming agent] by means of a jellifying agent," in order to "avoid any separation of the organic liquid and the thick saponaceous composition during storage or use...." Thus, Bluard's jellifying agent is intended to thicken the organic phase, not the aqueous phase, of his self-foaming composition.

Friedenberg discloses that colloidal materials including certain cellulose derivatives are useful as stabilizers in shaving creams or shampoos formulated as "very dilute emulsions" of at least 75%, preferably 85%, water. Friedenberg does not disclose the use of these colloidal materials in a gel-based composition, nor in a post-foaming composition.

British Patent Specification No. 838,913 to Colgate-Palmolive (Colgate) was also cited by the examiner to "show the state of the art." Colgate discloses the addition of

colloidal materials such as cellulose derivatives to "soap solutions of low concentration," so as to stabilize the lather of the disclosed "aerosol shave creams."

The examiner initially took the position that it would have been obvious to one skilled in the art to "substitute the claimed jellifying agents, i.e. colloids," for the jellifying agent [aluminum octoate] shown in Bluard, in view of Friedenbergs, "who show[s] said agents are well known for the same purpose in the same type of compositions[,] i.e. forming shaving compositions."

In response to the initial rejection, Johnson submitted results of consumer testing in which the formulation of Example 1 of Monson was unanimously preferred by a panel of shavers over a modified Monson formulation wherein Bluard's aluminum octoate had been substituted for the claimed water-soluble gelling agent. A second panel unanimously preferred the Monson formulation over a "self-foaming shaving cream" formulated according to Example 11 of Bluard. Eight out of nine members of a third panel preferred the Monson formulation over another "self-foaming shaving cream" formulated according to Example 10 of Bluard. After considering these showings, the examiner allowed the Monson application.<sup>2</sup> Johnson's resulting EDGE gel product went on to become an overwhelming commercial success; the district court found that EDGE accounted for more than 20% of the market for shaving products at the time of trial. *Gillette*, 12 USPQ2d at 1962.

Johnson sued Gillette on September 1, 1983, in the Northern District of Illinois, charging infringement of the Monson patent by Gillette's "Foamy Gel" product. Gillette in turn brought a declaratory judgment action of invalidity and unenforceability against Johnson in the District of Massachusetts. The Illinois action was transferred to Massachusetts and consolidated with the suit there, where trial took place. After the bench trial, Magistrate Collings

held in a very thorough opinion that Gillette had failed to prove that the Monson patent was invalid on the ground of obviousness, that Gillette had infringed by its manufacture, use, and sale of "Foamy Gel," that the infringement was willful, and that the case was "exceptional" under 35 USC 285, such that the court was authorized to award attorney fees to Johnson. *Id.* at 1964. Gillette then moved for reconsideration of the decision. In his memorandum opinion of March 28, 1990, fully answering Gillette's arguments, Magistrate Collings denied Gillette's motion and reaffirmed his holdings. See 15 USPQ2d at 1795. This appeal followed. Damages have yet to be determined.

This court previously upheld the validity of the Monson patent in *S.C. Johnson & Son, Inc. v. Carter-Wallace, Inc.*, 781 F.2d 198, 228 USPQ 367 (Fed.Cir.1986). Gillette was not a party to the *Carter-Wallace* litigation. The primary reference before the trial court there was, as here, the Bluard patent. The Friedenbergs patent was also considered, as well as other secondary references not involved in this suit. See *S.C. Johnson & Son, Inc. v. Carter-Wallace, Inc.*, 614 F.Supp. 1273, 1299-1301, 225 USPQ 1022, 1034-36 (S.D.N.Y.1985) (holding that Carter-Wallace had failed to sustain its burden of proving facts which support a conclusion of obviousness by clear and convincing evidence).

## II. ISSUES

1. Whether the district court erred in its application of 35 USC 103 to the facts of this case.

2. Whether Johnson should be awarded its attorney fees and expenses incurred in opposing this appeal.

## III. DISCUSSION

### 1. Standard of Review

[1, 2] The claims of Monson are entitled to a presumption of validity and Gillette

tions. There was no evidence offered at trial which would support a contrary conclusion. *Gillette*, 12 USPQ2d at 1960.

2. As the district court found, Johnson's tests demonstrated that Monson's product was, in fact, superior or produced results superior to any of Bluard's formula-

faces the burden of showing, by clear and convincing evidence, their invalidity. *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1359, 220 USPQ 763, 770 (Fed.Cir.), cert. denied, 469 U.S. 821, 105 S.Ct. 95, 83 L.Ed.2d 41 (1984). This burden is not lessened by Gillette's introduction at trial of prior art not before the PTO during prosecution. *Id.* at 1358-60, 220 USPQ at 770-71. The fact that the validity of those claims has previously been upheld in an earlier litigation is also to be given weight, though not *stare decisis* effect. See *Stevenson v. Sears, Roebuck & Co.*, 713 F.2d 705, 711, 218 USPQ 969, 974 (Fed.Cir.1983).

The only district court conclusion on appeal here is the determination of nonobviousness. Our precedent holds that the question of obviousness is one of law, freely reviewable by this court. See *Newell Cos. v. Kenney Mfg. Co.*, 864 F.2d 757, 762, 9 USPQ2d 1417, 1421 (Fed.Cir.1988) ("the trial court's conclusion on obviousness is subject to full and independent review by this court."), cert. denied, — U.S. —, 110 S.Ct. 62, 107 L.Ed.2d 30 (1989); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1388, 1344, 220 USPQ 777, 782 (Fed.Cir.) ("A conclusion on obviousness is one of law and subject to full and independent review in this court."), cert. denied, 469 U.S. 830, 105 S.Ct. 116, 83 L.Ed.2d 60 (1984); *Union Carbide Corp. v. American Can Co.*, 724 F.2d 1567, 1573, 220 USPQ 584, 589 (Fed. Cir.1984) ("this court reviews the issue of obviousness as one of law on which it must exercise independent judgment....").

3. See, e.g., *In re Kulling*, 897 F.2d 1147, 1149, 14 USPQ2d 1056, 1058 (Fed.Cir.1990) ("Although Miller's specific process is designed to recover the contents of the filter cake rather than the filtrate, it clearly suggests that when the wash solution is equivalent to an earlier existing solution, the latter may be used as a source for the former"); *In re Beaver*, 893 F.2d 329, 331, 13 USPQ2d 1409, 1411 (Fed.Cir.1989) (Nies, J., dissenting) ("I agree with the board that the references clearly suggest that the film magazine be interlocked in alignment with the focal plane of the lens"); *Ryo, Inc. v. Ag-Bag Corp.*, 837 F.2d 1418, 1425, 9 USPQ2d 1323, 1329 (Fed.Cir.1988) ("This teaching of the Nikkel patent, when considered with the Silopress machine, clearly suggests the substitution of the curved stripper bars for the stripper basket"); *Vandenberg v. Dairy Equipment Co.*, 740 F.2d 1560, 1568, 224 USPQ

## 2. Validity

The crux of Gillette's appeal is that the district court misapplied 35 USC 103 by adopting an overly stringent test for obviousness. More specifically, Gillette urges that the district court, in reliance on *Kimberly-Clark Corp. v. Johnson & Johnson*, 745 F.2d 1437, 223 USPQ 603 (Fed.Cir. 1984), committed legal error by requiring that a claimed combination be "clearly suggested" by the prior art in order to be obvious. In Gillette's view, this "clear suggestion" test is tantamount to requiring an explicit statement of the claimed subject matter, which would rebut novelty altogether. We did not go that far in *Kimberly-Clark*, nor do we now.

Gillette ignores the fact that in *Kimberly-Clark*, not only did we "fail to find a clear suggestion of the claimed subject matter," 745 F.2d at 1449, 223 USPQ at 610, we found "not the slightest suggestion" in the art of the claimed dual function adhesive. *Id.* at 1447, 223 USPQ at 609. Similarly, the district court in this case found no suggestion in the prior art, much less a clear suggestion, of the claimed composition viewed as a whole as it must be under § 103. See *Gillette*, 12 USPQ2d at 1953, 1956.

As to whether "clear suggestion" is a proper test of obviousness, we note initially that *Kimberly-Clark* is not the only instance in which we have made use of that phrase in a discussion of obviousness.<sup>2</sup>

195, 199 (Fed.Cir.1984) ("Thus, the prior art clearly teaches and suggests the combination of all the elements found in the '575 patent"); *Leas Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 890, 221 USPQ 1025, 1032 (Fed.Cir.1984) ("Nevertheless, such a removable cap is clearly suggested by the Avrea patent in combination with prior art patents to Woodward and Kately which do show removable caps which could effect such a function, though not involving removable retraction stems"); *In re Kronig*, 539 F.2d 1300, 1304, 190 USPQ 425, 428 (CCPA 1976) ("Obviousness under 35 U.S.C. § 103 does not require absolute predictability, ... and it is sufficient here that Yasui et al. clearly suggests doing what appellants have done, viz., adding water") (citations omitted); *In re Gershon*, 372 F.2d 535, 539, 152 USPQ 602, 605 (CCPA 1967) ("We think it is sufficient that the prior art clearly suggests do-

Various other formulations of the requisite level of suggestion for combining prior art disclosures have been set forth in our precedent. For example, we have said that "[o]bviousness does not require absolute predictability of success.... For obviousness under § 103, all that is required is a reasonable expectation of success." *In re O'Farrell*, 853 F.2d 894, 903-04, 7 USPQ2d 1673, 1681 (Fed.Cir.1988).

We need not decide here whether "clear suggestion" is an overly rigorous test for obviousness, however. As noted above, this court independently reviews obviousness determinations. In reaching our own conclusion regarding obviousness, we need not give deference to a particular analytical construct utilized in a district court's opinion. Our task is to review the district court's judgment.

[3] What we stressed in *Kimberly-Clark*, and have repeated many times since, was that 35 USC 103 requires analysis of a claimed invention as a whole:

It is true that [the claimed invention] consists of a combination of old elements so arranged as to perform certain related functions. It is immaterial to the issue, however, that all of the elements were old in other contexts. *What must be found obvious to defeat the patent is the claimed combination.*

745 F.2d at 1448, 223 USPQ at 609-10 (emphasis added). Focusing on the obviousness of substitutions and differences, instead of on the invention as a whole, is a legally improper way to simplify the often difficult determination of obviousness. *Hybritech, Inc. v. Monoclonal Antibodies*,

ing what appellants have done, although an underlying explanation of exactly why this should be done, other than to obtain the expected superior beneficial results, is not taught or suggested in the cited references.") (Emphases all ours.)

4. Counsel at oral argument disagreed on whether the *Friedenberg* and *Colgate* references disclosed gels. At trial, however, when *Gillette's* own expert, Dr. Schwartz, was asked whether the *Friedenberg* composition was a gel or a liquid, he answered that it was a liquid. When asked whether the *Colgate* patent disclosed a liquid or a gel, Dr. Schwartz again answered, "a liquid."

*Inc.*, 802 F.2d 1367, 1383, 231 USPQ 81, 93 (Fed.Cir.1986), cert. denied, 480 U.S. 947, 107 S.Ct. 1606, 94 L.Ed.2d 792 (1987).

[4] Here, the "claimed combination" is a composition whose individual components were concededly well known at the time of the invention. As the district court found, however, the prior art made no suggestion, *clear or otherwise*, of substituting the claimed water-soluble polymers for *Bluard's* oil-soluble jellifying agent; nothing in the prior art suggested the idea of a post-foaming shaving gel, much less one in which water-soluble polymers were used.

*Gillette* argues that prior art references such as *Friedenberg*, *Colgate*, and U.S. Patent No. 3,072,535 to *Mueller* would provide the necessary motivation to one of ordinary skill to make the suggested substitution. While these references do disclose the use of water-soluble polymers in shaving preparations, none of those preparations appears to be a gel.<sup>4</sup> Moreover, none are post-foaming in nature. See *Gillette*, 12 USPQ2d at 1947.

In any event, the *Bluard* patent, which is the closest prior art and the only reference to disclose a post-foaming preparation, would likely discourage the art worker from attempting the substitution suggested by *Gillette*. *Bluard* recommends using aluminum octoate to thicken the organic phase in order to make it compatible with a thick aqueous soap phase. Contrary to the district court's understanding,<sup>4</sup> water-soluble polymers would not serve this purpose in *Bluard's* composition. Insofar as the district court's "understanding" was a finding of fact, we set it aside as clearly erro-

5. Although the district court recognized a fundamental difference between the compositions of *Monson* and *Bluard*, i.e. that *Monson's* gelling agent is present in the aqueous phase of his composition, while *Bluard's* "jellifying agent" is added to the organic liquid (foaming agent), the court failed to see the significance of this fact. We refer to the court's statement that "[a]lthough the suggested 'jellifying agent', i.e. aluminum octoate, was water-insoluble, so far as I can understand, it was not its water-insolubility which caused it to perform the functions for which *Bluard* employed it." *Gillette*, 12 USPQ2d at 1947.

neous under Fed.R.Civ.P. 52(a). We agree with Johnson that the oil-solubility and water-insolubility of aluminum octoate is critical to Bluard's purpose of thickening the organic phase.

Johnson takes the position that, at most, the substitution suggested by Gillette may be "obvious to try." As we recently explained,

[s]n "obvious-to-try" situation exists when a general disclosure may pique the scientist's curiosity, such that further investigation might be done as a result of the disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain directions were pursued.

*In re Eli Lilly & Co.*, 902 F.2d 943, 945, 14 USPQ2d 1741, 1743 (Fed.Cir.1990). However, we have consistently held that "obvious to try" is not to be equated with obviousness under 35 USC 103. See *O'Farrell*, 853 F.2d at 908, 7 USPQ2d at 1680; *Hybritech*, 802 F.2d at 1380, 231 USPQ at 91; *Jones v. Hardy*, 727 F.2d 1524, 1530, 220 USPQ 1021, 1026 (Fed.Cir.1984).

An analysis of obviousness of a claimed combination must include consideration of the results achieved by that combination. As we explained in *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed.Cir.1985):

Critical to the analysis is an understanding of the particular results achieved by the new combination. The claims here at issue are directed to a combination of known components of telephone systems in an admittedly new way to achieve a new total system. Neither the district court in its opinion, nor the defendants, identified any suggestion in the prior art that the components be combined as they were by Feil or that such combination could achieve the advantages of the Feil system.

We see no reason why the above reasoning from *Interconnect*, a case that dealt with a mechanical invention, should not apply with equal weight to the present chemical case. There is no question that each component of Monson's composition was

separately known in the prior art. What was not known or suggested, however, was the composition that resulted from the combination of those components, and its unique properties. As Johnson succinctly states,

The Monson invention is a post-foaming gel composed of four components, all of which interact to provide a particular kind of gel with suitable shaving characteristics—in fact, shaving properties superior to any other product on the market. The invention as a whole is that composition, with its gel form, and its properties.

These superior properties resulting from Monson's invention have not been questioned by Gillette.

Gillette's counsel urged at oral argument that commercial considerations are not "what makes patentability." To the contrary, an analysis of obviousness must address objective evidence of nonobviousness, if any. See *Graham v. John Deere Co.*, 383 U.S. 1, 17–18, 86 S.Ct. 684, 694, 15 L.Ed.2d 545, 148 USPQ 459, 467 (1966). Objective evidence such as commercial success, failure of others, long-felt need, and unexpected results must be considered before a conclusion of obviousness is reached. *Hybritech*, 802 F.2d at 1380, 231 USPQ at 90.

We hold that the objective evidence of Johnson's commercial success with EDGE supports the nonobviousness of Monson's claims. As the district court found, "Johnson's product was new; nothing like it had been marketed before. It was radically different from any other shaving product on the market." 12 USPQ2d at 1963. The district court also found that EDGE's success was due to the product's properties, not increased advertising. *Id.* We see no error, much less clear error, in this finding of fact. Fed.R.Civ.P. 52(a).

Gillette's counsel also asserted at oral argument that through the work of its employees Peloquin and Rader, it "had the very same technology" at the same time as Monson (though not soon enough to represent prior invention). However, Gillette abandoned further research because, it claims, it made a "commercial mistake" in

failing to recognize that this "new-fangled approach" would appeal to consumers. This mistake, Gillette argues, was not due to any technical difficulties with the Pelouquin/Rader work, a point on which the record is less than clear.<sup>6</sup> We are not persuaded by Gillette's argument that the Pelouquin/Rader work evidences the obviousness of Monson's invention. As the district court found,

[t]he objective evidence of non-obviousness is that until the Johnson product was introduced and marketed, Gillette did not believe that a post-foaming shaving preparation such as Bluard taught would yield any better results to the shaving population than existing aerosol shaving preparations[,] regardless of whether aluminum octoate or water-soluble polymers were used as the "jellyifying" agent.

*Gillette*, 12 USPQ2d at 1963. Indeed, Gillette's skepticism is relevant and persuasive evidence of the nonobviousness of Monson's invention.

We reject Gillette's remaining argument that other art-recognized advantages of cellulose-based polymers, namely lubricity and consistency enhancement, provide the "suggestion" sufficient to motivate the art worker to substitute them for Bluard's aluminum octoate. This theory boils down to no more than hindsight reconstruction, of the type so aptly described by the poet Milton over three centuries ago:

The invention all admired, and each how he

To be the inventor missed; so easy it seemed,

Once found, which yet unfound most would have thought,  
Impossible!

PARADISE LOST, Part VI, L. 478-501.

In sum, we hold that the district court properly applied the law of 35 USC 103 to the facts of this case.

### 3. Attorney Fees

Johnson seeks reimbursement of its attorney fees and expenses for this appeal

6. For example, the district court's opinion states, "the evidence of Mr. Pelouquin's experiments confirmed the unsatisfactory results

pursuant to 35 USC 285 and Fed.R.App.P. 38. Johnson characterizes the appeal as frivolous, in that Gillette could not reasonably argue that the judgment below was based on legal error or that the district court's findings were clearly erroneous.

Upon the whole record and considering in particular the magistrate's two opinions and the arguments made by Gillette on this appeal, we conclude that the appeal cannot properly be characterized as frivolous. The case of *Mathis v. Spears*, 857 F.2d 749, 8 USPQ2d 1551 (Fed.Cir.1988) cited by Johnson was a much more aggravated situation and is clearly distinguishable on its facts. The request for attorney fees and expenses on appeal is therefore denied.

### CONCLUSION

The district court's judgment that Gillette failed to meet its burden of proving by clear and convincing evidence that the subject matter of the appealed claims would have been obvious under 35 USC 103 is affirmed. Johnson's request for attorney fees and expenses incurred by Johnson in connection with this appeal is denied.

### AFFIRMED



JACOBS WIND ELECTRIC COMPANY,  
INC., and Paul R. Jacobs,  
Plaintiffs-Appellants,

v.

FLORIDA DEPARTMENT OF TRANSPORTATION, Defendant-Appellee.

No. 90-1251.

United States Court of Appeals,  
Federal Circuit.

Nov. 20, 1990.

Florida resident who held patent on tidal flow system sued Florida Department

which were obtained when Bluard's formulations were used." *Gillette*, 12 USPQ2d at 1960.



ATTACHMENT 3

*Crown Operations International, Ltd. v. Solutia*, 289 F.3d 1367, 1372, 62 USPQ2d 1917  
(Fed. Cir. 2002)



H

Crown Operations International Ltd.

v.

Solutia Inc.

U.S. Court of Appeals Federal Circuit

No. 01-1144

Decided May 13, 2002

## PATENTS

1 Patentability/Validity - Anticipation - Prior art (§ 115.0703) Patentability/Validity - Obviousness - Relevant prior art - In general (§ 115.0903.01)

Patent directed to solar and safety control glass with minimal visual distortion is not anticipated by prior art patent, since invention addresses visual distortion problem by limiting visible reflectance contribution of solar control film layer to no more than about 2 percent, whereas prior patent does not discuss or disclose 2 percent limitation, since prior reference will not be assumed to inherently contain claimed property merely because it discloses same structure, and since declaratory plaintiff has not presented sufficient evidence to rebut presumption of validity and defendant's facial evidence that prior patent does not disclose 2 percent limitation; patent is not obvious in light of prior art, since plaintiff has not shown that prior art contains teaching, suggestion, or motivation to reduce reflectance contribution to about 2 percent.

2 Patentability/Validity - Specification - Enablement (§ 115.1105)

Genuine issue of fact exists as to whether patent in suit, directed to elimination of optical distortion in solar and safety control glass, is invalid for lack of enablement, since patent teaches measurement of texture of solar film layer in glass by calculating "wave index" using average amplitude and average pitch, but amplitude is not defined in patent, since person of ordinary skill in art would recognize several ways to measure amplitude, since amplitude

directly impacts wave index calculation, and varying amplitude measurements produces range of wave index results, since novel aspects of invention must not be left to inference, since patent does not specify boundaries for average pitch and amplitude used to calculate wave index, leaving open possibility of range of embodiments that meet limitation but are inoperative, and since patent's rules for determining which wave peaks and valleys are small enough to be eliminated from index calculation are ambiguous.

## PATENTS

Particular patents - General and mechanical - Safety and solar film for glass

4,973,511, Farmer, Ho, Rick, and Woodard, composite solar/safety film and laminated window assembly made therefrom, summary judgment that patent is not invalid affirmed.

5,091,258, Moran, laminate for a safety glazing, summary judgment that patent is not invalid for lack of enablement reversed.

Appeal from the U.S. District Court for the Western District of Wisconsin, Shabaz, S.J.

Action by Crown Operations International Ltd. and Marshall H. Krone against Solutia Inc. for declaratory judgment that defendant's patents are invalid. Plaintiffs appeal from grant of summary judgment in favor of defendant. Affirmed as to patent no. 4,973,511; reversed and remanded as to patent no. 5,091,258.

Joseph T. Leone and Joseph A. Ranney, of DeWitt, Ross, and Stevens, Madison, Wis., for plaintiffs-appellants.

Gregory E. Upchurch, Kenneth R. Heineman, and Dudley W. Von Holt, of Thompson Coburn, St. Louis, Mo., for defendant-appellee.

Before Lourie, Clevenger, and Gajarsa, circuit judges.

Gajarsa, J.

Crown Operations International, Ltd., and Mr. Marshall H. Krone (collectively "Crown"), appeal the decision of the United States District Court for the Western District of Wisconsin denying Crown declaratory relief that Solutia's U.S. Patent No. 4,973,511 ("the '511 patent") is invalid for lack of novelty and non-obviousness, and that Solutia's U.S. Patent No. 5,091,258 ("the '258 patent") is invalid for lack of enablement and written description. *Crown Operations Int'l, Ltd. v. Solutia, Inc.*, No. 99-C-802-S, slip op. at 8 (W.D. Wis. Aug. 30, 2000) (memorandum decision and order granting summary judgment) ("August 30 Order"); *Crown Operations Int'l, Ltd. v. Solutia, Inc.*, No. 99-C-802-S, slip op. at 24, 27 (W.D. Wis. Aug. 22, 2000) (same) ("August 22 Order"). Because we find no error in the district court's opinion with respect to the '511 patent, we affirm that portion of the district court's decision. However, because the district court erred in its analysis of enablement for the '258 patent, and did not address the written description issue for the '258 patent, we reverse the district court's grant of summary judgment on that issue and remand for additional proceedings consistent with this opinion.

## I. BACKGROUND

The patents at issue in this appeal relate to layered films used to create safety and solar control glass. An example is an automobile windshield. Most windshields have two layers of glass with a multi-layer film between the glass layers. The multi-layer film adds properties to the glass assembly, such as impact resistance or providing a conductive layer that facilitates defrosting the windshield. An inner layer of the film has solar control properties to selectively reflect, absorb (and thus convert to heat) or transmit defined percentages of certain wavelengths of light. This inner layer is called the solar control film. It is made of a substrate coated by one or more layers of metal or metallic substances. '511 patent, col. 3, l. 64 to col. 4, l. 2. Typ-

ically, manufacturers laminate the solar control film between layers of plasticized polyvinyl butyral ("PVB") (sometimes called the "safety film") in a process known as encapsulation. Then, the encapsulated solar control film is sandwiched between two pieces of glass for a final assembly of multi-layer glass with safety and solar control properties.

### A. The '511 Patent

The '511 patent is directed to the problem that the metal-coated substrate, i.e., solar control film, tends to wrinkle during encapsulation causing visual distortions. The '511 patent claims to mask the wrinkles from detection by the human eye by limiting to two percent or less the visible light reflection contribution of the solar control film compared to reflection from a complete assembly of glass, PVB and solar control film. '511 patent, col. 4, ll. 46-49, col. 8, l. 66 to col. 9, l. 6, col. 14, l. 67 to col. 15, l. 2. Figure 1 from the '511 patent, set forth below, shows the layers in a complete assembly.

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The complete safety and solar control glass assembly 10 includes two outer glass layers 28 & 30, PVB layers 22 & 23, and the solar control film 20. The solar control film is comprised of a substrate layer 16 and solar control coating 18. '511 patent, col. 3, ll. 41-53, col. 7, ll. 2-4, col. 10, l. 15. Figure 3 from the '511 \*1919 patent, set forth below, shows the sub-layers of the solar control coating 18.

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Layer 18 is made of multiple sub-layers. Layers 34 and 36 are metal oxide, and layer 38 is metal. '511 patent, col. 5, ll. 12-14. In addition, the '511 patent notes that "[p]rior automotive windshields have visible light reflection contributions for their solar films of three percent or greater." Further, it relates that the primary method of achieving a low solar

control film reflectance contribution is by providing a specially-designed solar coating. '511 patent, col. 4, ll. 56-65.

On December 16, 1999, Crown sued Solutia (the "Initial Complaint"), seeking, among various other relief, a declaration that the '511 patent was invalid for anticipation and obviousness. Upon the parties' cross-motions for summary judgment, the district court found the '511 patent not anticipated and not invalid for obviousness. *August 22 Order* at 24, 27. We discuss herein only those portions of the *August 22 Order* relevant to the issues on appeal, which relate solely to the summary judgment finding that the '511 patent was not invalid on the grounds of anticipation and obviousness.

Claim 1, the only independent claim of the '511 patent, is set forth below, with the element numbers from Figure 1 inserted into the claim.

1. A composite solar/safety film [24]for use in a laminated window assembly [10] comprising:

a flexible, transparent plastic substrate layer [16]having a carrier surface and an opposing back surface;

a multilayer solar control coating [18] on said carrier surface, said coated substrate defining a solar control film [20]; and

at least one flexible, transparent, energy absorbing plastic safety layer [23 and/or 22] bonded to a surface of said solar control film;

wherein said solar control film contributes no more than about 2% visible reflectance, based on total visible incident radiation, in a laminated window assembly containing said composite solar/safety film laminated to at least one rigid transparent member [30 and/or 28].

'511 patent, col. 14, l. 57 to col. 15, l. 4 (emphasis added and emphasized numbers added to identify elements shown in Figure 1 above).

Crown argued that U.S. Patent No. 4,017,661 to Gillery (the "Gillery patent") anticipates the '511 patent. The district court held otherwise, because, while the Gillery patent discloses the first three limitations of claim 1 of the '511 patent, it does not disclose the two percent visible reflectance limitation. The court found that neither the Gillery patent claims nor its description expressly disclose a two percent limit on reflectance contribution from the solar control film layer. Crown argued that the two percent limitation was inherently present in the Gillery patent's teachings because the Gillery patent disclosed an assembly with PVB layers, substrate layer, and substrate metal-coating-arguably of the same composition and thickness of the films disclosed by the '511 patent. Thus, Crown argued, because the structure, thickness and materials of the assembly were the same or within the same range(s), the Gillery patent must inherently disclose a two percent limitation. The district court rejected this argument because it found that none of the embodiments disclosed by the Gillery patent meet the two percent visible light reflectance limit.<sup>FN1</sup>

In its *August 22 Order*, the district court also held that the '511 patent was not rendered invalid for obviousness by Gillery or the other prior art cited by Crown because no prior art discloses: (i) that reflectance below two percent will mask wrinkles; (ii) a solar control film layer with reflectance below two percent; or (iii) any suggestion, motivation or teaching to reduce solar control film visible light reflectivity below two percent. Although the prior art generally sought to reduce visible light reflectivity, it also taught disadvantages of a very thin metal-coating on the substrate, including sacrificing infrared reflectivity. Thus, it taught that the proper compromise to \*1920 achieve the conflicting goals of infrared (non-visible light) reflectance, visible light transmission and conductivity was a solar control film with a visible light reflectivity greater than two percent.

B. The '258 Patent

The '258 patent is directed at eliminating optical distortion, called "applesauce," in safety and solar control glass assemblies of the type discussed above for the '511 patent. The '258 patent discloses a method to control distortion otherwise caused by the safety and solar film layer by measuring and controlling the texture of the surface of the PVB layers. The method expresses texture using a "wave index" and a "roughness value." The wave index calculation is at issue in this appeal. Wave index indicates the relative waviness of the surface of the PVB. Determining wave index involves measuring the surface of the PVB and then aggregating the measurements into a single number, the wave index, through a calculation purportedly described in the '258 patent.

The '258 patent directs one to use an instrument to physically measure the waviness of the surface of the PVB and capture the measurement into an electronic "trace line" representing the contours of the PVB surface. '258 patent, col. 7, ll. 54-65. Since the "trace line" is stored electronically, a computer program is used to calculate wave index from the trace. Three figures from the '258 patent, given below, provide examples of PVB surface trace lines.

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The rules for calculating the wave index implement a "smoothing" function. The smoothing process seeks to eliminate minor inflection points (peaks or valleys) to simplify the calculation of wave index. '258 patent, col. 7, l. 66 to col. 8, l. 2.

In the Initial Complaint, Crown sought a declaration that the '258 patent was invalid for anticipation and obviousness. Then, on May 26, 2000, Crown amended the complaint (the "Amended Complaint") to additionally claim in Count VI that the '258 patent is invalid under 35 U.S.C. § 112, first paragraph, because it lacked enablement and written description due to ambiguities in the disclosed wave index calculation. In its *August 22 Order*, the district court found the '258 patent not anticipated

and not invalid for obviousness. *August 22 Order* at 28-29.

With respect to Count VI of Crown's amended complaint, Solutia moved for summary judgment on Crown's enablement and written description claim. Crown opposed Solutia's summary judgment motion, arguing that the '258 patent did not meet the enablement and written description requirements. The district court found the '258 patent not invalid for lack of enablement, but did not discuss in its opinion the written description requirement. *August 30 Order* at 8-13. We discuss herein only those portions of the *August 30 Order* relevant to the issues on appeal, which relate to summary judgment finding the '258 patent not invalid on the grounds of enablement and the procedural disposition of the written description issue.

Claim 1 of the '258 patent is set forth below. In the language of this claim, "laminated" refers to the complete glass, PVB and solar control film assembly, and "functional performance layer" refers to the solar control coating. '258 patent, col. 3, ll. 45-65.

1. A laminate which is substantially free of reflected distortion when used in a safety glazing comprising:

a transparent, thermoplastic substrate layer, optionally surface treated or coated, bearing one or more functional performance layers; and

at least one layer of plasticized polyvinyl butyral bonded on one side to a functional performance layer or the substrate layer and having a roughened deairing surface on its other side characterized by a roughness value,  $R_z$ , of at least 10 micrometers;

said at least one plasticized polyvinyl butyral [PVB] layer, before bonding to the substrate layer or functional performance layer, possessing low surface waviness on each side characterized by a wave index\*1921 value,  $W_I$ , of less than 15,000 square micrometers.

'258 patent, col. 12, ll. 2-16 (emphasis added).

Crown argued that the rules disclosed by the '258 patent for calculating wave index are not sufficiently precise to enable a person of ordinary skill in the art to practice the '258 patent without undue experimentation. The wave index calculation as described by the '258 patent is set forth below.

In this regard, considering the waviness profile as a series of peaks and valleys, the smoothing rules of the program consider an inflection point to be a true peak or valley if it is: i) at least 100 micrometers away from the immediately preceding prior peak or valley and ii) at least 0.5 micrometer above or below the immediately preceding prior peak or valley, a valley being at least 0.5 micrometer below the immediately preceding prior peak. Pitch (P) is the distance between one valley and the next valley or in other words across the base of a peak. Average amplitude (H avg) and average pitch (P avg) are determined by the program for the smoothed trace of ten 12.5 mm tracing lengths (the second five lengths being 90° to the first five lengths). From the average of the averaged H's and P's, a WI value is computed from the equation: Wave Index (WI) = (H avg) x (P avg) where H avg and P avg are in microns.

'258 patent, col. 8, ll. 3-19.

Crown asserted that according to the disclosed wave index "calculation," one of ordinary skill in the pertinent art would not know whether to instruct the smoothing program to disregard a peak by comparing it to an immediately preceding peak, or to a valley. The district court held that common sense and the clarifying clause "a valley being at least 0.5 micrometer below the immediately preceding prior peak" defeated Crown's argument. Thus, the district court held that the alleged grammatical ambiguities in the rules disclosed for calculating wave index did not invalidate the patent for lack of enablement.

Crown timely appealed the district court's two orders, raising the issues of anticipation and obvious-

ness of the '511 patent, and lack of enablement and written description of the '258 patent. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

## II. STANDARD OF REVIEW

We review a district court's grant of summary judgment without deference. *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1378, 53 USPQ2d 1225, 1227 (Fed. Cir. 1999). Summary judgment is appropriate when the moving party demonstrates that "there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law." Fed. R. Civ. P. 56(c); *Celotex Corp. v. Catrett*, 477 U.S. 317, 322-23 (1986). On summary judgment, the evidence must be viewed in the light most favorable to the party opposing the motion. *Poller v. Columbia Broad. Sys., Inc.*, 368 U.S. 464, 473 (1962), with doubts resolved in favor of the nonmovant, *Cantor v. Detroit Edison Co.*, 428 U.S. 579, 582 (1976); *Transmatic, Inc. v. Gulton Indus., Inc.*, 53 F.3d 1270, 1274, 35 USPQ2d 1035, 1038 (Fed. Cir. 1995). Once the moving party has satisfied its initial burden, the opposing party must establish a genuine issue of material fact and cannot rest on mere allegations, but must present actual evidence. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). Issues of fact are genuine only "if the evidence is such that a reasonable jury could return a verdict for the nonmoving party." *Id.* A disputed fact is material if it might affect the outcome of the suit such that a finding of that fact is necessary and relevant to the proceeding. *Id.*; *General Mills, Inc. v. Hunt-Wesson, Inc.*, 103 F.3d 978, 980, 41 USPQ2d 1440, 1442 (Fed. Cir. 1997).

A patent is invalid for anticipation when the same device or method, having all of the elements contained in the claim limitations, is described in a single prior art reference. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 894, 221 USPQ 669, 673 (Fed. Cir. 1984). An anticipating reference

must describe the patented subject matter with sufficient clarity and detail to establish that the subject matter existed in the prior art and that such existence would be recognized by persons of ordinary skill in the field of the invention. See *In re Spada*, 911 F.2d 705, 708, 15 USPQ 1655, 1657 (Fed. Cir. 1990); *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 678, 7 USPQ2d 1315, 1317 (Fed. Cir. 1988).

Obviousness is a legal conclusion based on underlying facts of four general types, all of \*1922 which must be considered by the trier of fact: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) any objective indicia of nonobviousness. See *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 [148 USPQ 459] (1966); *Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1270, 20 USPQ2d 1746, 1750-51 (Fed. Cir. 1991); *Panduit Corp. v. Denison Mfg. Co.*, 810 F.2d 1561, 1566-68, 1 USPQ2d 1593, 1594 (Fed. Cir. 1987).

"Determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention." *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 546, 48 USPQ2d 1321, 1329 (Fed. Cir. 1998). There must be a teaching or suggestion within the prior art, within the nature of the problem to be solved, or within the general knowledge of a person of ordinary skill in the field of the invention, to look to particular sources, to select particular elements, and to combine them as combined by the inventor. See *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 665, 57 USPQ2d 1161, 1167 (Fed. Cir. 2000); *ATD Corp.*, 159 F.3d at 546, 48 USPQ2d at 1329; *Heidelberger Druckmaschinen AG v. Hanscho Commercial Prods., Inc.*, 21 F.3d 1068, 1072, 30 USPQ2d 1377, 1379 (Fed. Cir. 1994) ("When the patented invention is made by combining known components to achieve a new system, the prior art must provide a suggestion or motivation to make such a combination.").

The written description inquiry is a factual one and must be assessed on a case-by-case basis. See *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1561, 19 USPQ2d 1111, 1116 (Fed. Cir. 1991) (quoting *In re Smith*, 458 F.2d 1389, 1395, 173 USPQ 679, 683 (CCPA 1972) ("Precisely how close the original description must come to comply with the description requirement of § 112 must be determined on a case-by-case basis.")). In order to satisfy the written description requirement, the disclosure as originally filed does not have to provide in haec verba support for the claimed subject matter at issue. See *Fujikawa v. Wattanasin*, 93 F.3d 1559, 1570, 39 USPQ2d 1895, 1904 (Fed. Cir. 1996). Nonetheless, the disclosure must convey with reasonable clarity to those skilled in the art that the inventor was in possession of the invention, *Vas-Cath Inc.*, 935 F.2d at 1563-64, 19 USPQ2d at 1116-17, although we have also clarified that the possession test alone is not always sufficient to meet the written description requirement, *Enzo Biochem, Inc. v. Gen-Probe Inc.*, No. 01-1230, 2002 WL 487156, at \*7 (Fed. Cir. Apr. 2, 2002). As such, "the written description requirement is satisfied by the patentee's disclosure of 'such descriptive means as words, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention.'" *Enzo Biochem*, 2002 WL at \*7 (quoting *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997)). Put another way, one skilled in the art, reading the original disclosure, must reasonably discern the limitation at issue in the claims. *Walde-mar Link GmbH & Co. v. Osteonics Corp.*, 32 F.3d 556, 558, 31 USPQ2d 1855, 1857 (Fed. Cir. 1994).

Whether a claim is enabled under 35 U.S.C. § 112, first paragraph is a question of law, although based upon underlying factual findings. See *PPG Indus., Inc. v. Guardian Indus. Corp.*, 75 F.3d 1558, 1564, 37 USPQ2d 1618, 1623 (Fed. Cir. 1996); *In re Goodman*, 11 F.3d 1046, 1049-50, 29 USPQ2d 2010, 2013 (Fed. Cir. 1993).

### III. DISCUSSION

A. The '511 Patent

On appeal, Crown describes various purported errors in the district court's analysis of the validity of the '511 patent. Despite Crown's contentions, we ascertain no error requiring reversal of the district court's determination of validity over Crown's claims of anticipation and obviousness.

Regarding alleged anticipation by the Gillery patent, on its face the Gillery patent does not disclose or discuss a two percent limitation for the reflectance contribution of the solar control film. Crown maintains that the '511 patent merely claims a preexisting property inherent in the structure disclosed in the prior art. Crown urges us to accept the proposition that if a prior art reference discloses the same structure as claimed by a patent, the resulting property, in this case, two percent solar control film reflectance, should be assumed. We decline to adopt this approach because this proposition is not in accordance with our cases on inherency. If the two percent reflectance limitation is inherently <sup>FN2</sup>1923 disclosed by the Gillery patent, it must be necessarily present and a person of ordinary skill in the art would recognize its presence. *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999); *Continental Can*, 948 F.2d at 1268, 20 USPQ2d at 1749. Inherency "may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Id.* at 1269, 20 USPQ2d at 1749 (quoting *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981)).

In arguing inherent disclosure of the two percent limitation in the Gillery patent, Crown bears an evidentiary burden to establish that the limitation was necessarily present.<sup>FN3</sup> The moving party in a summary judgment motion has the burden to show "that there is an absence of evidence to support the non-moving party's case;" the non-moving party must affirmatively demonstrate by specific factual allegations that a genuine issue of material fact ex-

ists for trial. *Celotex Corp. v. Catrett*, 477 U.S. 317, 322-23 (1986). A patent enjoys a presumption of validity, *see* 35 U.S.C. § 282, which can be overcome only through clear and convincing evidence, *see United States Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1563, 41 USPQ2d 1225, 1232 (Fed. Cir. 1997). Given the presumption of validity afforded the '511 patent, Crown has failed to meet its burden because it has not presented sufficient evidence to rebut the facial evidence offered by Solutia that the Gillery patent does not disclose the two percent limitation. *See Eli Lilly & Co. v. Barr Lab. Inc.*, 251 F.3d 955, 962, 58 USPQ2d 1869, 1874 (Fed. Cir. 2001) ("[A] moving party seeking to have a patent held not invalid at summary judgment must show that the nonmoving party, who bears the burden of proof at trial, failed to produce clear and convincing evidence on an essential element of a defense upon which a reasonable jury could invalidate the patent."); *In re Robertson*, 169 F.3d at 745 (recognizing that extrinsic evidence may be required to establish inherency). Instead, Crown offers only an assumption and its own contentions.<sup>FN4</sup>

Crown also argues that the district court erred by comparing reflectance values in the Gillery patent to non-corresponding values in the '511 patent. *August 22 Order* at 23-24. While perhaps the district court could have been more careful to explain the basis of its comparison, on a close reading of the district court's analysis we find that the alleged improper comparison only supported the district court's primary point - that no embodiment of the Gillery patent disclosed the two percent limitation, a conclusion that Crown has not shown to be in error.

Finally, Crown argues that various prior art references invalidate the '511 patent as obvious in view of such prior art. Crown's arguments lack merit because it has not shown that the prior art contains a teaching, suggestion or motivation to reduce the reflectance contribution of the solar control film to "no more than about two percent," and the district



court properly concluded that there was no such teaching, suggestion or motivation in the prior art cited by Crown. See *Ruiz*, 234 F.3d at 665, 57 USQP2d at 1167; *In re Rouffet*, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998).

#### B. The '258 Patent

On appeal, Crown argues that the district court erred in analyzing the impact of the ambiguities in the wave index calculation on the enablement requirement for the '258 patent. In \*1924 addition to its enablement attack, Crown also argues that the '258 patent does not meet the written description requirement of § 112, first paragraph.

The two requirements, while related and springing from the same factual predicates,<sup>FN5</sup> each carry a separate purpose. The purpose of the enablement requirement is to "ensure[] that the public knowledge is enriched by the patent specification to a degree at least commensurate with the scope of the claims." *Natl'l Recovery Techs., Inc. v. Magnetic Separation Sys.*, 166 F.3d 1190, 1196, 49 USPQ2d 1671, 1675 (Fed. Cir. 1999). One of our predecessor courts has held the enablement and written description requirements to be separate and distinct, and has held that a "specification may contain a disclosure that is sufficient to enable one skilled in the art to make and use the invention and yet fail to comply with the description of the invention requirement." *In re Barker and Pehl*, 559 F.2d 588, 591, 194 USPQ 470, 472 (CCPA 1977). Subsequently, this court has held that the purpose of the written description is distinct from merely explaining how to make and use the invention. See *Enzo Biochem*, 2002 WL at \*7-8; *Vas-Cath*, 935 F.2d at 1563-64, 19 USPQ2d at 1117. In light of the odd procedural setting of the written description issue in this appeal, our disposition of this appeal based on enablement, and given that the two requirements are distinct and each are necessary, we do not reach the written description issue except to note that it appears to remain available for adjudication or disposition by the district court on remand.<sup>FN6</sup>

Turning to the enablement issue, we agree with Crown that the ambiguities and lack of specified boundary conditions, and Crown's proffered evidence concerning the same, raise a genuine issue of material fact as to whether a person of ordinary skill in the pertinent art could make or use the invention of the '258 patent<sup>FN7</sup> without undue experimentation. *White Consol. Indus. v. Vega Servo-Control*, 713 F.2d 788, 791, 218 USPQ 961, 963-64 (Fed. Cir. 1983). The district court found otherwise. However, it appears not to have considered the statements of Crown's expert concerning the effect of unspecified boundary conditions on the calculation of wave index.

Following the reasoning of the district court, Solutia argues that a person of ordinary skill in the pertinent art could overcome any ambiguities in the wave index calculation without undue experimentation by testing a limited number of possibilities for computing the wave index. In response, Crown offers statements of its expert that the '258 patent does not define amplitude and that a person of ordinary skill in the art would not know whether to measure amplitude: (i) from a centerline running horizontally through the "middle" of the trace; (ii) from "peak-to-peak," i.e., from the bottom of a valley to the top of a peak; or (iii) from some other baseline or reference running horizontally somewhere through the trace. On its face, the '258 patent does not define amplitude. However, average amplitude directly impacts the wave index calculation because wave index is the result of multiplying average amplitude by average pitch. Simply put, the wave index calculation would produce two separate numbers \*1925 if calculated with a centerline versus a "peak-to-peak" amplitude. Worse yet, a range of various wave index values are possible for amplitude baselines running horizontally somewhere through the trace at various locations. To show that the wave index calculation is enabled, Solutia cites various details from the '258 patent concerning how to perform the test to generate a trace of the PVB surface to calculate wave index. However, Solutia does not present sufficient evid-

ence to rebut Crown's demonstration of the amplitude ambiguity in the wave index calculation. This is so because: (i) the amplitude is a direct input to the critical claim limitation, a wave index of less than 15,000 square micrometers; and (ii) the novel aspects of the invention must be disclosed and not left to inference, that is, a patentee may not rely on the inference of a person of ordinary skill in the pertinent art to supply such novel aspects. See *Genetech Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1366, 42 USPQ2d 1001, 1005 (Fed. Cir. 1997) (stating that the knowledge of a hypothetical person of ordinary skill in the art cannot be used to supply the patentable aspects of the invention).

Compounding the amplitude ambiguity, Crown also notes that the wave index is the result of two independently varying, unbounded terms: average pitch and average amplitude. On its face, this does not seem to be a problem. However, Crown's expert noted that because boundary conditions are not specified, the claim covers inoperative embodiments. For example, a wave index of 15,000 square micrometers results from an average height of 1000 micrometers multiplied by an average pitch of 15 micrometers. Yet, according to Crown's expert, an average height of 1000 micrometers would not be acceptable for the PVB. As with the amplitude ambiguity, the problem goes well beyond this single example because a full range of resulting inoperative embodiments are possible for values of average height and average pitch that, when multiplied, produce a wave index value that meets the limitation of the claim. Such inoperative embodiments do not necessarily invalidate the claim. See *Atlas Powder Co. v. E.I. du Pont de Nemours & Co.*, 750 F.2d 1569, 1576-77, 224 USPQ 409, 414 (Fed. Cir. 1984); *In re Cook*, 439 F.2d 730, 735, 169 USPQ 298, 302 (CCPA 1971) (noting that although claims may read on some inoperative embodiments, this does not necessarily invalidate the claim if the necessary information to limit the claims to operative embodiments is known to a person of ordinary skill in the art).<sup>FN8</sup> However, the inoperative embodiments support Crown's assertion that there is a genuine is-

sue of material fact with respect to enablement. See *Atlas Powder*, 750 F.2d at 1576-77; see also *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1358-59, 52 USPQ2d 1029, 1034-35 (Fed. Cir. 1999) (holding that the district court failed in its claim construction to consider the effect of inoperative embodiments on invalidity due to lack of enablement).<sup>FN9</sup>

Further compounding the ambiguities with the wave index rules, the '258 patent's rules for determining which inflection points are "true" inflection points additionally support Crown's argument that it has raised a genuine issue of material fact. Crown demonstrated in various ways through its experts and arguments the potential indeterminacy in the rules. Solutia's expert admitted that there was some ambiguity in the rules with respect to whether a preceding peak or valley was the reference point in selecting a "true" peak or valley.

Solutia argues that even if the disclosed wave index calculation has ambiguities and is indeterminate, a person of ordinary skill in the pertinent art would be able to make and use the invention with some experimentation, but less than "undue" experimentation. Solutia argues that such a skilled person would only have to try two possibilities for amplitude, centerline and "peak-to-peak," and that experimenting to discover which of two possibilities to use is well within the boundary of undue experimentation. Crown counters that the amplitude ambiguity and potential inoperative embodiments, combined with the ambiguities in the smoothing rules, seems to suggest "1926 a wide range of possibilities which one must try."<sup>FN10</sup> With this wide range of possibilities, we agree that Crown has raised a genuine issue of material fact as to the amount and type of experimentation required, facts that will determine whether such experimentation is undue. See *Enzo Biochem Inc., v. Calgene Inc.*, 188 F.3d 1362, 1371, 52 USPQ2d 1129, 1135-36 (Fed. Cir. 1999) (holding that a reasonable amount of experimentation does not invalidate a patent, but undue experimentation does invalidate, and holding

that the *Wands* factors, which determine whether a patent's disclosure is insufficient such that the experimentation required would be undue, apply to inter partes litigation).<sup>FN11</sup> While ultimately a trier of fact may reach the conclusion that any required experimentation is not undue, Crown has shown that sufficient potential for undue experimentation exists such that disposal on summary judgment is improper.

### CONCLUSION

Because we hold that the '511 patent has not been shown to be invalid due to anticipation or obviousness and that a genuine issue of material fact exists with respect to facts underlying the determination of enablement for the '258 patent, we affirm-in-part and reverse-in-part the district court's decision and remand for additional proceedings consistent with this opinion.

AFFIRMED-IN-PART, REVERSED-IN-PART,  
AND REMANDED.

### COSTS

Each party bears its own costs.

FN1. The district court, applying a similar analysis, also found that UK Patent Application GB 2 057 355 (the "UK patent") did not anticipate the '511 patent because it did not have the two percent limitation.

FN2. In order to claim "equivalent structure" between the Gillery patent and the '511 patent, Crown's inherency argument rests on a precondition of its own making - that the Gillery patent discloses use of TiO<sub>2</sub>, even though it specifies TiO<sub>x</sub>, where x is greater than 1.0 but less than 2.0. Although Crown vigorously argues this point, we do not reach this issue because even if Crown is correct that the structures are

equivalent, Crown's inherency argument fails for the reasons set forth herein.

FN3. Crown's reliance on *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 36 USPQ2d 1225 (Fed. Cir. 1995), and *O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 42 USPQ2d 1777 (Fed. Cir. 1997), to characterize the two percent limitation as a "performance limitation" similar to the claim terms at issue in those cases is unpersuasive and overbroad. Respectively, *Pall* and *Tekmar* dealt with the claim terms "skinless" and "passage." Beyond the readily apparent difference between these potentially broad terms and the precise specification of a two percent limit in the '511 patent, characterizing a claim limitation as a "performance characteristic" is not helpful as to whether the "necessarily present" requirement of inherency is met.

FN4. As indicated by this Court's questions at oral argument concerning the seemingly direct route to prove that the Gillery patent contains the two percent limitation- implementing an embodiment of the Gillery patent and testing it- this Court finds puzzling Crown's reluctance regarding this approach to generate extrinsic proof that the Gillery patent inherently meets the two percent limitation.

FN5. Also springing from these same underlying factual predicates is the § 112, second paragraph, definiteness requirement. This requirement is distinct from the enablement and description requirements, which arise from § 112, first paragraph.

[D]efiniteness and enablement are analytically distinct requirements, even though both concepts are contained in 35 U.S.C. § 112. The definiteness requirement of 35 U.S.C. § 112, ¶ 2 is a legal requirement, based on the court's role as construer of patent claims . . . . Definiteness requires the language of the claim to set forth clearly the domain over which

the applicant seeks exclusive rights. . . . The test for whether a claim meets the definiteness requirement is "whether one skilled in the art would understand the bounds of the claim when read in light of the specification."

*Process Control Corp.*, 190 F.3d at 1358 n.2, 52 USPQ2d at 1034 n.2 (internal citations omitted). See also 3 Donald S. Chisum, Chisum on Patents, § 8.03 at 8-14(2001) (noting the difference between the requirements of "definiteness, which claims must meet, from the requirements of enablement, which the disclosures of the specification must meet").

FN6. Based on the record before us, the written description issue has the following procedural posture: (i) Crown's Count VI of its amended complaint raised the written description issue; (ii) Solutia's summary judgment motion argued that the '258 patent met the written description requirement; (iii) in opposition Crown argued that the written description requirement was not met; (iv) the district court did not dispose of the written description issue or discuss the issue in its opinion in a way that enables our review; and (v) Crown preserved the written description issue in its appeal to this court and thus has not waived its further adjudication on remand.

FN7. All seventeen claims of the '258 patent refer to wave index, thus they all stand or fall together.

FN8. The court in *In re Cook* further notes that a claim may be invalid if it reads on significant numbers of inoperative embodiments. *In re Cook*, 439 F.2d at 734, 169 USPQ at 301-02 (citing *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 336 U.S. 271, 276-77, 80 USPQ 451, 453 (1949)). See also *In re Moore*, 439 F.2d 1232, 1236169 USPQ 236, 239 (CCPA 1971) (noting that the question is whether the scope of enablement conveyed by the

disclosure to a person of ordinary skill in the art is commensurate with the scope of protection taught by the claims); Chisum, § 7.03[7][a] at 7-108 & n.6.

FN9. The inoperative embodiment inquiry informs the enablement inquiry; they are not the same inquiry. *Natl Recovery Techs.*, 166 F.3d at 1196, 49 USPQ2d at 1676.

FN10. We note that the specification for the '258 patent states that in the disclosed embodiment the wave index is calculated using a software program running on a personal computer being fed the trace line. '258 patent, col. 7, ll. 64-68. Undoubtedly, Solutia took care to ensure that the program contained the necessary boundary conditions and other information to calculate wave index to practice the invention. It appears, however, that Solutia took substantially less care in transcribing the information from the program into the specification's rules for calculating wave index. This incongruity will be relevant to the question of enablement upon remand. See Chisum, § 7.03[4][e] at 7-86 & n.77 ("A specification that claims an invention requiring implementation through computer software but fails to set forth the details of computer programming may present issues of whether the experimentation required to write the programming is reasonable or unreasonable.") (summarizing the teachings of various cases).

FN11. The *Wands* factors are:

- (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

FN11. *In re Wands*, 858 F.2d 731, 737,8  
USPQ2d 1400, 1404 (Fed. Cir. 1988).

C.A.Fed.

Crown Operations Intern., Ltd. v. Solutia Inc.

289 F.3d 1367, 62 U.S.P.Q.2d 1917

END OF DOCUMENT

ATTACHMENT 4

*In re Hedges*, 783 F.2d 1038, 1041, 228 USPQ 685 (Fed. Cir. 1986)

if Fine had attempted to do so, the Board would have received the evidence. The record before us shows that the limitation was material.

### III

Accordingly, we make the following changes in our opinion of October 9, 1985:

A. The first paragraph of the opinion is changed to read as follows:

This is an appeal from a decision of the Patent and Trademark Office Board of Patent Interferences (Board) which, following a request to dissolve an interference between U.S. Patent No. 4,018,562 (Parks patent) and application Serial No. 512,374 filed by Fine, awarded priority to Fine. The award of priority to Fine is reversed.

B. On the first two lines of the first paragraph on page 4 of the opinion immediately prior to part II, the words "refused to dissolve the interference and" are deleted.

C. The last paragraph of the opinion is amended to state:

The decision of the Board awarding priority to Fine is reversed.

D. The words "and VACATED" are deleted from the last line of the opinion.



In re Charles V. HEDGES and  
Victor Mark.

Appeal No. 85-2524.

United States Court of Appeals,  
Federal Circuit.

Feb. 12, 1986.

United States Patent and Trademark Office Board of Appeals affirmed the rejection of certain claims of a patent application for a process for preparing aryl sul-

fone sulfonic acids. The Court of Appeals, Pauline Newman, Circuit Judge, held that inventors' proceeding contrary to accepted wisdom was strong evidence of unobviousness.

Reversed.

#### 1. Patents ¶113(1)

Patent and Trademark Office solicitor did not violate rule against presenting new issues on appeal when he referred to new portions of references cited by applicant during examination for further support of same rejection that had been upheld by Patent and Trademark Office Board of Appeals.

#### 2. Patents ¶36(3)

Inventors' proceeding contrary to accepted wisdom was strong evidence of unobviousness of process for preparing aryl sulfone sulfonic acids.

Martin B. Barancik, Mount Vernon, Ind., argued for appellants. With him on the brief was John W. Schneller, Lyon & Lyon, Washington, D.C.

Henry W. Tarring, Associate Solicitor, Office of the Solicitor, of Arlington, Va., argued for appellee. With him on the brief, were Joseph F. Nakamura, Solicitor and Fred E. McKelvey, Deputy Solicitor.

Before MARKEY, Chief Judge, MILLER, Senior Circuit Judge, and NEWMAN, Circuit Judge.

PAULINE NEWMAN, Circuit Judge.

The decision of the United States Patent and Trademark Office (PTO) Board of Appeals (Board), affirming the rejection of claims 8, 9, and 10 of United States patent application Serial No. 301,396 as unpatentable under 35 U.S.C. § 103, is reversed.

### OPINION

This patent application of Charles V. Hedges and Victor Mark (collectively Hedges or applicant) is for a "Process for Pre-

paring Aryl Sulfone Sulfonic Acids". Claim 8 is representative:

8. A process for sulfonating diphenyl sulfone which comprises contacting diphenyl sulfone in its molten state with a sulfonating agent consisting essentially of sulfur trioxide under substantially anhydrous conditions in the absence of a solvent.

Hedges' invention is the reaction of diphenyl sulfone, at a temperature above its melting point of 127°C, with liquid or gaseous sulfur trioxide in the absence of water or a solvent, thereby sulfonating the sulfone in high yields without forming by-product sulfuric acid.

The only rejection is under 35 U.S.C. § 103, and the Board relied only on Felix U.S. Patent No. 2,010,754. Hedges has cited three additional references, parts of which were discussed by the Board: Mark U.S. Patent No. 3,948,851, British Patent No. 820,659, and certain pages of a book by Gilbert entitled "Sulfonation and Related Reactions". The PTO Solicitor on this appeal discusses and relies on all these references.

Felix shows the sulfonation of aryl sulfones with sulfur trioxide in the form of fuming sulphuric acid. Sulfonation is carried out at 5-10°C, after which the temperature rises exothermically to 30°C before it is lowered to room temperature. The Board held that this, without more, makes a prima facie case of obviousness.

Hedges has taken the position, before the Board and before us, that the low temperatures shown by Felix defeat any prima facie case of obviousness of the reaction at above 127°C. Hedges also argues that, viewing the references as a whole, it would not have been obvious to operate in the molten state at high temperatures. The Board held that Hedges had not produced "persuasive objective evidence" in rebuttal.

Only after the PTO has made a prima facie case of obviousness does the burden of coming forward shift to the applicant. *In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976). If a prima facie case is made in the first instance, and

if the applicant comes forward with reasonable rebuttal, whether buttressed by experiment, prior art references, or argument, the entire merits of the matter are to be reweighed. *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed.Cir.1984).

In the case before us, we do not agree with the PTO that Felix alone supports a prima facie case of obviousness. Felix makes clear that low temperatures are the desired conditions for this reaction. However, the Solicitor has elaborated on and strengthened the PTO argument by drawing on the additional prior art cited by Hedges. Hedges takes vigorous exception to this procedure, arguing that he has been deprived of the opportunity to respond before the PTO to these "new grounds of rejection" and to produce evidence in rebuttal.

[1] We and our predecessor court have not condoned the presentation of new grounds of rejection for the first time on appeal. *In re Hounsfield*, 699 F.2d 1320, 1324, 216 USPQ 1045, 1049 (Fed.Cir.1982); *In re Zeidler*, 682 F.2d 961, 967, 215 USPQ 490, 494 (CCPA 1982); *In re Nygard*, 341 F.2d 924, 928-29, 144 USPQ 586, 590 (CCPA 1965). In Hedges' case the Solicitor referred to new portions of the references cited by Hedges during examination for further support of the same rejection that had been upheld by the Board. Hedges had relied on these references before the Board, as he does before us, for his argument that viewed as a whole the body of prior art teaches away from conducting this reaction at high temperatures. The Solicitor should not be constrained from pointing to other portions of these same references in contravention of Hedges' position. *In re Wesslau*, 853 F.2d 238, 241, 147 USPQ 391, 393 (CCPA 1985) (the reference is considered in its entirety for what it fairly suggests to one skilled in the art). On these facts, we do not discern that the Solicitor has violated the rule against presenting new issues on appeal. The Solicitor has done no more than search the references of record for disclosures perti-



nent to the same arguments for which Hedges cited the references.

[2] The PTO argues that Felix shows no upper limit to the temperature of the reaction, and that determining the optimum temperature is a matter of "routine experimentation". The plain reading of Felix is contrary to the PTO position. As was said in *In re Rosenberger*, 386 F.2d 1015, 1018, 156 USPQ 24, 26 (CCPA 1967), "[t]his appears to be an extremely strained interpretation of the reference which could be made only by hindsight."

To overcome this deficiency in Felix the Solicitor directs attention to the British patent, which discusses the reaction of liquid phenols with liquid sulfur trioxide in the absence of a solvent. The PTO points to the teachings of reaction at elevated temperature:

The invention is applicable to liquid and solid phenols ... having melting points up to 115°C ... and to mixtures of phenols whose individual melting point is higher than 115°C but which give in admixture a melting point of 115°C or lower.

For mono-sulphonic acids ... the temperature is kept above the melting point of the phenol used.

... the liquid sulphur trioxide is added ... at a temperature slightly above the melting point of the phenol in the case of solid phenols, and after the addition the reaction mass is heated at a higher temperature of 160-180°C....

The highest-melting phenol illustrated in the British patent is resorcinol, melting point 110°C, to which

liquid sulfur trioxide is added ... at a temperature of 115-140°C.... The product, which is almost black in colour and sets to a brittle solid on cooling, is substantially the monosulphonic acid in quantitative yield.

The Solicitor asserts that this shows that aromatic compounds can be sulfonated, in the absence of solvent, in the molten state, at the temperatures contemplated by Hedges. Hedges argues that the British patent expressly teaches that the reaction cannot

be carried out with phenols that melt higher than 115°, that the upper temperature range reported for resorcinol is reached during the exothermic reaction, and that the black color and brittle product are due to charring and decomposition. Hedges argues that the British patent does not negate the overall teachings of the art as a whole that lower temperatures are preferred for optimum results, and that the charring at higher temperatures that is shown in the British patent belies the broad conclusion that the Solicitor attempts to draw. The cited references support Hedges' position.

The Mark patent shows diphenyl sulfone sulfonated with sulfur trioxide and states that by "well known methods ... these reactions can be carried out at room temperature or at elevated temperatures such as about 50°C". Mark, who is co-inventor herein, has averred that reaction at 50°C obviously requires the presence of a solvent, because diphenyl sulfone is a solid at 50°C. The PTO does not dispute this point. We do not agree with the Solicitor that Mark is an open-ended teaching of the use of higher temperatures, such as over 127°C, for this reaction, merely because Mark does not state that "about 50°C" is a maximum temperature; that PTO reading is not a reasonable one. Applicant argues that the Mark patent is a further example of the belief then held by those skilled in this art that lower temperatures were needed for optimum results in direct sulfonation reactions. Mark as co-inventor has supported this view with declarations of record.

Both the Solicitor and the applicant rely on the Gilbert book which, at page 67, discusses the reaction of benzene with sulfur trioxide under various conditions. Gilbert states:

With both reagents in the vapor phase, a 50% yield of sulfone is obtained at 150-200°C, and 30% at 70-80°C.... Addition of SO<sub>3</sub>, either as a liquid or vapor, to liquid benzene gives 15-18% sulfone, but addition of liquid benzene to liquid SO<sub>3</sub> yields 7.5%.

Hedges argues that this counters Gilbert's general statement, on which the PTO places great emphasis, that "[p]otentially, the most attractive and practical procedure for sulfonating benzene and other aromatics is by direct reaction with SO<sub>3</sub>, since the process is instantaneous, smoothly exothermic, and can involve simple mixing of the two liquids". Hedges points out that despite these "potential" advantages, Gilbert's specific example of the "simple mixing of two liquids" gave only a 15-18% yield.

In contrast to Gilbert's 15-18% yield from the reaction of sulfur trioxide with liquid benzene, Hedges obtained a 96% yield from the reaction of sulfur trioxide with liquid diphenyl sulfone. Other portions of Gilbert, discussed by both the PTO and Hedges, are equally subject to conflicting interpretation. We agree with Hedges that Gilbert cannot fairly be given the predictive virtues attributed to it by the Solicitor.

Hedges argues that he sulfonates liquid diphenyl sulfone at high temperature without the expected charring or reduced yields, and that "the totality of the prior art disclosures leads substantially away from the claimed invention". We agree with Hedges that the prior art as a whole must be considered. The teachings are to be viewed as they would have been viewed by one of ordinary skill. *Kimberly-Clark v. Johnson & Johnson*, 745 F.2d 1437, 1454, 228 USPQ 603, 614 (Fed.Cir.1984); *In re Mercier*, 515 F.2d 1161, 1165, 185 USPQ 774, 778 (CCPA 1975). "It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art". *In re Wesslau*, 353 F.2d at 241, 147 USPQ at 393. Hedges correctly points out that the references all suggest that lower temperatures of reaction are preferable. No reference suggests that diphenyl sulfone may advantageously be reacted in the molten state with sulfur trioxide. The data provided by Hedges show

significant advantages of the claimed invention; these data are not challenged by the PTO.

On balance, Hedges proceeded contrary to the accepted wisdom. This is "strong evidence of unobviousness". *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1552, 220 USPQ 303, 312 (Fed.Cir.1983), cert. denied. — U.S. —, 105 S.Ct. 172, 83 L.Ed.2d 107 (1984), citing *United States v. Adams*, 383 U.S. 39, 86 S.Ct. 708, 15 L.Ed.2d 572 (1966).

The PTO decision that the invention of claims 8-10 would have been obvious in terms of 35 U.S.C. § 103 is reversed.

REVERSED.



**AFFILIATED FM INSURANCE COMPANY, as Subrogee of Fiat Motors of North America, Inc., & Fiat Motors of North America, Inc., Appellants,**

**v.**

**The UNITED STATES, Appellee.**

Appeal No. 85-2525.

United States Court of Appeals,  
Federal Circuit.

Feb. 14, 1986.

Appealed from U.S. Court of International Trade; Dominick L. DiCarlo, Judge.

Henry J. Catenacci, Podvey, Sachs & Catenacci, Newark, N.J., argued for appellants. With him on brief was Herbert I. Waldman.

Susan Hendler-Menahem, Commercial Litigation Branch, Dept. of Justice, New York City, argued for appellee. With him on brief were Richard K. Willard, Acting Asst. Atty. Gen., David M. Cohen, Director and Joseph I. Lieberman, Attorney in Charge, Intern. Trade Field Office.